DECEMBER 2013

PROFIT FROM A WORLD OF CONNECTED DEVICES

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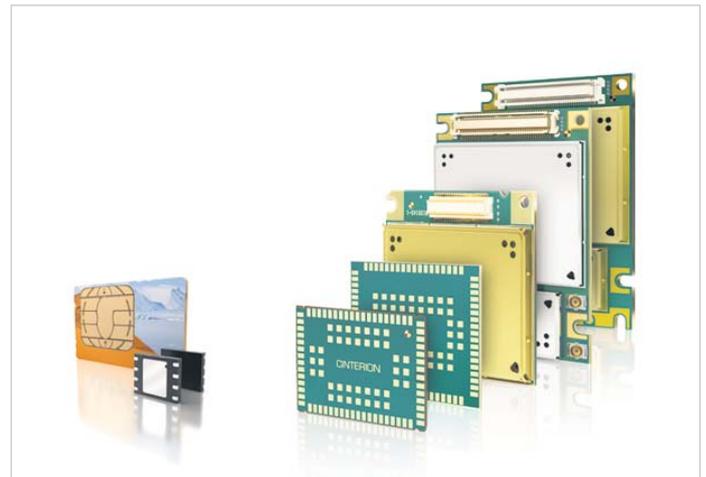
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Cover Sponsor: Telit Wireless Solutions enables machine-to-machine communications worldwide providing wireless module technology, M2M managed services and value added services, including connectivity. The company constantly works for technology leadership through six research & development centres across the globe. Telit offers an extensive portfolio of high quality cellular, short-range RF, and GNSS modules, available in over 80 countries. For details go to: **www.telit.com**

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Let's talk more to end users!

Jeremy Cowan

I'm frustrated, and I'm not alone. This is about M2M in mobile Healthcare but it applies to other verticals, too. M2M isn't working as it should. The US had a head start in mHealth: It has a Federal tax regime, and health and communications regulators; one official language, currency, and insurance-led payment model. So, it's the perfect incubator for mHealth solutions, right? Wrong. Off the record, mHealth solution providers complain to us that they struggle to get wireless devices deployed behind hospital firewalls. IT departments are petrified of letting in a Trojan Horse that reveals Protected Health Information (PHI), and as they face epic fines and even jail if patient data leaks out, who can blame them? But if health plans, healthcare clearinghouses and providers can transmit PHI electronically for claims or eligibility inquiries, it must also be possible to make it easier for mHealth solution providers to meet the criteria of the USA's Health Insurance Portability and Accountability Act (HIPAA).

Meanwhile, costly and unevenly distributed healthcare in the US is set against a backdrop of the incompetent launch of "Obamacare". It's no better in Europe, where national governments (frequently the purse-holders) lurch from economic crisis (Ireland, Italy, Greece and Spain) to organisational catastrophe (the UK), to bloated expense (France and Germany). Even solution providers who can demonstrate the savings in OpEx that they can deliver are ignored because fixing the 'Big Picture" is priority #1.

So why am I frustrated if, as one CEO says (see Supplement, page S4), "We're standing on the threshold of a new generation of health services that cut delivery costs, extend the reach of care givers, and bring new levels of care to patients"? I don't doubt him, I just don't want us still to be standing on the threshold in two years' time. If mHealth solutions are to help as we believe they can, this industry has to start selling its Benefits. Outwardly. I once

assumed, naively, that Big Government understood M2M. Today, I don't think it's even aware of M2M or its benefits to patients; yet it might be a vital solution. It's time that the M2M / IoT community (from CTIA, ETSI, GMA, GSMA, IMC, to M2M Alliance, oneM2M and the rest of the alphabet soup) actively invited the US FCC and FDA, the EC's Directorate general for Health & Consumers, and national Departments of Health and Industry to meet regularly and discuss how we make mHealth solutions work for them, as Dan MacDuffie says, to "cut delivery costs, extend the reach of care givers, and bring new levels of care to patients."

Jeremy Cowan
Editor & Publisher, M2M Now

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Telit acquires ILS Technology and expands into M2M cloud services

Telit Wireless Solutions, a global provider of machine-to-machine (M2M) solutions, products and services, has acquired ILS Technology LLC (ILST). ILST is a US-based provider of ready-to-use cloud platform services connecting enterprise IT systems to M2M-enabled devices as well as machines for businesses-critical use.

The acquisition is designed to complement Telit's strength in mobile network-side services with cloud-based solutions, and will accelerate M2M application development.

The ILST product lines secureWISE and deviceWISE will remain: secureWISE delivers secure data exchange for large data volumes; and deviceWISE products are said to be rich in potential for M2M adopters concerned with security, scalability and integration with modern IT infrastructures.

With ILST, Telit will also be able to expand the reach of m2mAIR to offer internet-side services. This could help M2M adopters who have been seeking more integrated

solutions, especially for on-boarding M2M assets to cloud-enabled IT infrastructures in low entry-cost, platform-as-a-service (PaaS) service models.

Oozi Cats, chief executive at Telit Wireless Solutions, said: "The ILST acquisition opens up new opportunities to expand our service offerings to small and medium M2M customers worldwide, widening our market advantage. We see tremendous synergies between our hardware and connectivity offerings and the portfolio from ILST."

Wireless carriers must reshape to cash in on M2M segment

A white paper entitled *MNO Strategies in the Cellular M2M Market*, from IHS Inc, suggests that the number of cellular M2M connections will more than triple by the end of 2017 and global connections will rise to 375 million in 2017 (up from 116 million in 2012). In parallel, revenue generated by cellular M2M services from wireless carriers is likely to rise to US$22.4 billion in 2016, up from US$9.6 billion in 2012.

"Wireless service providers ranging from Verizon Wireless, to Vodafone, to China Mobile are turning to the cellular M2M market as a new, high-growth market opportunity," said Sam Lucero, senior principal analyst for M2M & the Internet of Things at IHS.

"However, to take full advantage of the M2M's market's potential, the wireless firms must deliver their customers much

more than simple cellular connectivity. Instead these companies must offer a full suite of VAS and MAP services, prompting them to establish their own M2M business units and develop or acquire M2M connection platforms," Lucero added.

Sam Lucero: M2M connection platforms needed

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AT&T and GE sign global alliance agreement for industrial internet

AT&T and GE have collaborated to allow GE machines to connect to the AT&T network, mobility assets and M2M expertise to create the first highly-secure wireless communications system for GE's wireless 'Industrial Internet'. Workers using the system will be able to remotely track, monitor, record and operate GE machinery, virtually anywhere in the world.

The plan is to develop offerings that meld AT&T network technologies, single global SIMs (subscriber identity modules), device expertise, security, and cloud access for industrial products like electric vehicle chargers, lighting and engines. The companies also plan to collaborate in the AT&T Foundry® innovation centre to build M2M solutions for GE's software platform Predix™ that can proactively maintain and remotely control industrial machines.

US$4bn for mobile operators using analytics to cut churn and increase up-sell

A report from Juniper Research says that the implementation of analytics platforms is enabling operators to anticipate the likelihood of customers moving so that they can take preventative action. Using insight from big data, the potential increase in revenues for operators stands

at almost US$4 billion per year by 2018.

According to the report, *Mobile Analytics & Big Data Strategies for MNOs, Brands and OTTs 2013-2018*, a number of leading network operators have already seen significant reductions in consumer churn levels following the implementation of analytics platforms. For example, MTN South Africa deployed a Big Data programme in 2012 combining subscriber information and social network analysis to determine priority users and customer networks. The company subsequently experienced annualised churn decline by more than 20%.

While churn reduction was the primary benefit for operators in emerging markets, players in more developed markets (such as C Spire Wireless in the US) were increasingly found to be coupling analytics with a customer loyalty programme to improve user retention.

ORBCOMM acquires SENS asset tracking operation from Comtech

Global provider of M2M solutions, ORBCOMM Inc, has completed the acquisition of Comtech Mobile Datacom Corporation's (Comtech) Sensor Enabled Notification System (SENS) operation. SENS provides one-way satellite products and services to more than 20,000 subscribers worldwide including government, defence, transportation, logistics, and oil and gas industries, all of which are key vertical markets for ORBCOMM.

The acquisition includes the satellite hardware tracking devices, network technology and web platforms that enable customers to retrieve and view critical data from the field via the Globalstar satellite communications network. The deal particularly complements ORBCOMM's multi-network operator strategy and strengthens its position as a provider of satellite and cellular communications for the M2M industry.

"The SENS acquisition expands ORBCOMM's portfolio of services by adding new offerings to our existing suite of satellite and cellular network services," said Marc Eisenberg, chief executive officer of ORBCOMM. "We see this market segment growing rapidly based on customers that can benefit from the Globalstar network's reliable, low-power, low-cost, one-way satellite data service for short messaging along with its unique advantages in power management."

Wyless acquires majority stake in TM Data Brazil

Boston, Massachusetts-based Wyless, a global M2M managed services provider and TM Data, the first Brazilian M2M operator, have agreed the acquisition by Wyless of a majority stake in TM Data and the joint formation of Wyless TM Data Brazil. And one analyst says this makes Wyless more of a target for acquisition themselves.

Founded 13 years ago in Sao Paulo, TM Data offers M2M managed services in Brazil, operating a managed network connected to all four national mobile network operators; Vivo, Claro, TIM and OI. TM Data provides managed connectivity across all major machine-to-machine communications (M2M) verticals and is also

rolling out ancillary services in network management, consulting and equipment lifecycle management. Through Porthos™, the Wyless global delivery platform, Wyless TM Data Brazil will also extend its reach into other international markets.

Dan McDuffie, Wyless's CEO, said: "Brazil is one of the largest growth opportunities in the M2M and Internet of Things market globally, and one of the most challenging of the BRIC regions to enter. Wyless TM Data Brazil will offer a bridge to and from this coveted market for our partners around the world, and also serve as a jumping off point into other bordering Latin countries. It's not just about connectivity, but end-to-

end solutions, from local representation, certification assistance, consulting, and a broad range of managed services."

Matt Hatton, director of Machina Research commented: "The big challenge (in Brazil) is around 'permanent roaming'. Several players have decided to get themselves a Brazilian presence. Wyless is now a little more attractively positioned to be an acquisition target, possibly for an MNO that has pretensions at being a global M2M provider."

Matt Hatton

NEWS IN BRIEF | NEWS IN BRIEF | NEWS IN BRIEF | NEWS IN BRIEF | NEWS IN BRIEF | NEWS IN BRIEF | NEWS IN BRIEF

Sierra Wireless to acquire M2M assets from AnyDATA Corporation

Jason Cohenour

Sierra Wireless has agreed to acquire all the assets of AnyDATA Corporation and those of all its subsidiaries. Upon completion, AnyDATA's M2M embedded modules and modem business will be absorbed into Sierra Wireless' OEM solutions product line, along with a team of 16 sales and engineering staff from AnyDATA's Korean subsidiary.

"With significant market share and established sales channels in Korea, and a proven engineering team, we believe that the AnyDATA M2M business represents an important addition to Sierra Wireless," said Jason Cohenour, president and CEO of Sierra Wireless.

Axeda enters into strategic customer relationship with Microsoft

A new agreement with the USA's Axeda Corporation will build on Microsoft's devices and services strategy, to focus on translating machine data into new insights that can be used to grow, expand and streamline operations, and improve business processes.

Axeda, a provider of cloud-based services for building and deploying M2M and Internet of Things (IoT) solutions, will support Microsoft by facilitating the connectivity, two-way secure communications, and machine data streaming from industry devices across multiple Windows Embedded-based platforms.

Comarch joins the Digital Living Network Alliance

The global software house and system integrator, Comarch, has joined the Digital Living Network Alliance (DLNA) as a contributor member. The DLNA is a cross-industry consortium of more than 250 companies united to enable consumers to easily network their electronic devices for media sharing throughout the home.

Membership extends Comarch's co-operation with DLNA. Being familiar with its standards and having the necessary technical competences, Comarch will further support DLNA in adding new functionalities to certification tools, according to changes in the organisation's standards, and work together on leveraging the technology.

SIMalliance re-elects Frédéric Vasnier as chairman

Frédéric Vasnier

SIMalliance, the global, non-profit association which aims to simplify secure element (SE) implementation to drive the creation, deployment and management of secure mobile services, has announced that Frédéric Vasnier has been re-elected to serve a further one-year term as chairman of the Board. Vasnier, senior vice president of the telecoms business unit at Gemalto, takes up his fifth term as chair of the organisation, after an election among fellow SIMalliance board members representing **Giesecke & Devrient, Incard, STMicroelectronics, Morpho, Oberthur Technologies** and **VALID**.

Vasnier said: "2014 will be a very important year for SIMalliance as the organisation continues to advance interoperability and co-operation across the global SE ecosystem. The organisation's roadmap for the year ahead is currently being finalised, however near-term priorities include projects on M2M and mobile internet security. We also seek to further our industry collaboration, to ensure that SIMalliance continues to address relevant market requirements and reflect the most advanced technical evolutions."

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"Are you a new customer? Wow! I thought you were just another old customer who came back to complain."

Two senior appointments at Wyless

Charles Kriete

Michael Chase

Charles Kriete joins the **Wyless** management team as senior vice-president, sales. He joins **from Tech Data**, where he was the executive vice-president of its TD mobility division; a company that he co-founded in 2005 as OTBT and that was later acquired by and operated as a joint venture between Tech Data and **Brightstar**.

Kriete joins another Tech Data veteran and OTBT cofounder, Michael Chase, who was appointed as VP of global operations for Wyless earlier this year.

Dan McDuffie, CEO of Wyless, Inc. commented: "Charles and Michael both bring a wealth of experience to the Wyless management team. The fact that they've worked together for so many years and achieved great success in TD Mobility ensures that the impact they are already making in our scalability and market positioning will be swift and demonstrative

of things to come."

Charles Kriete said, "I wanted to join a company that not only was a pioneer in the M2M/IoT space, but also ready for exponential growth via channels. Wyless' ability to offer a recurring revenue to the channel on connectivity, M2M services and ongoing support is a key differentiator in the current mobile channel environment. We have already built elements of a great programme for partner sales, these will be enhanced over the coming months."

Renesas Electronics Europe finds new general manager

Günther Elsner

A provider of advanced semiconductor solutions, **Renesas Electronics Europe**, has promoted Günther Elsner to the position of general manager of its Automotive Business Group.

Starting a career in the semiconductor industry in 1983, Elsner worked for **Fairchild Semiconductor**, moving later to

Nissei Sangyo (Hitachi Group) as sales manager for key accounts. Joining **NEC Electronics** in 1988, Elsner continued his career in key account management and developed the company's sales in the automotive segment. He was then promoted to sales manager, Germany, of the Automotive Business Group in 2003 and again to head of European sales for the division in 2005. When NEC Electronics merged with Renesas Technology in 2010, Günther Elsner worked to harmonise the

automotive sales organisations of the companies while continuing to direct European automotive sales for the new group.

"Günther is one of the principal architects of our success in the automotive industry, which will continue to be crucial for Renesas going forward," said Gerd Look who recently took over as president of Renesas' Electronics European operations.

Alexander Bufalino is senior executive vice-president (SEVP) Global Marketing at Telit Wireless Solutions, in charge of all aspects of brand, traditional, digital, above & below the line marketing. Alex is the mind behind telit2market magazine, and past finalist of the prestigious SABRE Awards. Alex joined Telit in 2005 leaving his post of sales director at Siemens AG, M2M division. He currently serves as one of five governors for the International M2M Council (IMC), which was started in 2013 to foster widespread M2M adoption across a diverse range of industrial and consumer sectors by bringing together solution providers and users of M2M technology globally.

mHealth gains ground as one-stop shops and M2M with 'wired safety net' bring efficient patient monitoring

For years analysts have touted mobile healthcare as a huge opportunity for those offering machine-to-machine communication (M2M) services. Truth be told, the progress so far has been patchy, at best. So *M2M Now* asked Alexander Bufalino, SEVP Global Marketing at Telit, to describe the hurdles in the way of M2M mHealth, how they are now being overcome and what the future holds.

M2M Now: What is stopping mobile health professionals from really embracing M2M?

Alexander Bufalino: For the most part delivery models keep professionals from a broader embrace of M2M. This is a heavily regulated industry and healthcare providers the world over typically have to comply with norms and regulations from government agencies as well as payers – typically insurance companies. That makes adoption of anything new very complicated – not only M2M.

The most successful efforts with this particular M2M user community have been those sponsored, supported, or initiated by either governments or insurers. And that is why we are seeing some of the slowness in broader acceptance. Solution providers from outside healthcare with a higher comfort level integrating M2M, have a longer road ahead than established eHealth vendors to get their products and services properly certified and aligned with both groups. And those inside the healthcare industry feel differing degrees of intimidation when they look at the complexity of connecting their devices with M2M. These range from adding the proper module to managing the deployments under mobile networks and integrating them into the back-end systems with providers such as clinics and hospitals and with payers such as government agencies and insurers.

These professionals have used wireless technology for a long time. But it is nearly always within the four walls of their clinics and hospitals. Larger deployments that involve connecting outside these four walls have typically been wired solutions. And 'cutting the cord' on these systems is the first necessary step for the broader embrace.

This cord-cutting transition is starting to pick up pace now, with the advent of 'one-stop shop' delivery models from the M2M industry. One-stop shops remove differing degrees of barriers to adoption for solution providers for mHealth.

This is a necessary and important step because it allows these providers to test wireless M2M connectivity with systems already certified and working well on a wired basis. It provides this community the opportunity to focus on learning M2M with the safety net of the wired systems to fall back to.

One-stop shops also contribute the fastest rise in familiarity with the features and capabilities of M2M, accelerating new solution ideas from these professionals to the market.

What can be done by the M2M industry and other industries or groups to promote mHealth?

AB: As a provider of enabling technology, the M2M industry needs first to understand what constitutes a solution for mHealth. **Telit**, for example, has for a number of years, maintained internal organisations staffed with experts from the key verticals whose job it is to ensure we have all the proper certifications, services, and products to compose solutions for the different verticals.

Add that to the one-stop shop delivery model and now we are really removing enough risk from the adoption equation for mHealth to move.

Is there much waste and inefficiency in the healthcare space and, if so, can M2M help to eradicate it? ➔

AB: Consider the case of medication compliance. Data shows that there are over 300 million chronically ill individuals in the US and Europe, with 60% of them having two or more chronic diseases. Medication compliance (which represents the fraction of chronically-ill patients keeping reasonably well to the medication regimen prescribed by their doctors) declines to 50% after six months from the diagnosis and start of treatment; and down to 33% in five years. Another important fact in this particular space of medication compliance is that the average chronically-ill patient takes over five medications daily.

So, as you view these rather bleak statistics, it is easy to understand why up to 90% of all health spending in these two regions goes towards treating chronic conditions, with 40% hospital readmissions due to lack of patient medication compliance. It is also easy to understand how much well-being can improve for chronically-ill patients and savings could be realised for governments, insurers and ultimately societies if M2M solutions could improve these numbers.

Vaica Medical, a Telit customer, is rolling out a bold solution for medication compliance improvement among chronically-ill patients (*see Case Study on page S13 in the attached supplement*). The clever device prompts the patient to take the prescribed medication at the proper time, alerting care-givers or doctors' offices if the patient does not take them when prompted. Their next generation solution will support the use of blister packs prepared and supplied directly by the patient's pharmacy which is also alerted when refills need to be prepared and/or delivered to the patient.

This is but one example of how inefficiency and waste can start to be removed from the space with bold new solutions from the intersection of expertise in the challenges facing the space and the uncomplicated offering from M2M one-stop shops.

Which application areas are likely to develop fastest in mHealth?

AB: As the developed world population ages, there is a strong focus on bringing solutions to market that improve quality of life for the independent-living elderly. The Vaica medical solution I mentioned earlier positioned squarely in that space as are great numbers of research and development efforts in industry and academia.

Take another example; the issue of falling

and inability to get back up which hinders independent living for many seniors. Current solutions rely on the senior carrying and being able to activate a wearable panic button. Statistics show dismal success rate for this activation in cases of a fall, for a number of reasons. **The University of Utah** in the US recently published a paper showing encouraging progress in the development of a sensor that can detect an individual's fall followed by extended stay on the floor. That sensor technology integrated in a connected device can restore confidence for the elderly and their families.

Which countries or regions are adopting mHealth most quickly, and how can others catch up?

AB: As I mentioned before, adoption rates have closely tracked the incidence of programmes and incentives by governments and payers. As a result we have seen broader scale adoption in the Nordic European countries than most other regions from such programmes as the Northern Periphery Program (NPP) started in 2007 which ran through 2013 followed by a successor programme from 2014 to 2020. These NPP programmes foster the competitive delivery of healthcare to sparsely populated areas which is a marked characteristic of this particular group of countries, with creative application of technology including (but not limited to) M2M.

Central Europe and the US will be able to look at these as cases studies and glean best practices in policy making as they develop their own programmes, even though these regions are challenged by much higher incidence of health issues – particularly with lifestyle diseases such as diabetes and hypertension coupled with much more uneven socio-economic make-up in their population than the Nordics.

But the US, Central Europe, and parts of the Middle East and APAC will definitely catch up soon since the sheer numbers in waste and inefficiencies are massive, as we demonstrated above. In the US, for example, hospitals and insurers have been pouring a lot of resources into R&D to shrink the duration of post-procedure stays in the hospital. With every day being charged to insurers at rates going from a few to several thousand dollars, every single day reduced in a patient's stay in hospital translates quickly into billions of dollars of savings since the country is quickly approaching its one millionth hospital bed.

M2M technology has made great strides with commercial solutions for efficient and reliable monitoring of patients, essentially extending the reach of the post-op nurse station to the home. That trend is likely to remain strong for this fascinating segment which is just starting to discover M2M.

www.telit.com   http://www.im2mc.org/

Continuous innovation delivers scalability and reliability to remove M2M complexities

Jahangir Mohammed
is the chief executive of
Jasper Wireless

As the M2M market matures, all the players in the ecosystem are starting to understand their roles, where they fit in and what they can do to accelerate the growth of the market. Here Jahangir Mohammed, the chief executive of Jasper Wireless, tells M2M Now how the complexities of M2M service delivery are being overcome and identifies the ripe opportunities for all the players in the M2M service chain. Mohammed has been in the M2M market since its inception and, prior to founding Jasper Wireless in 2005, he founded and served as chief executive of Kineto Wireless where he pioneered technologies to converge GSM and Wi-Fi.

M2M Now: Where do you see enterprises investing most in M2M?

Jahangir Mohammed: Really broadly, we see explosive growth opportunities across several industries in M2M, increasingly viewed as a holistic 'Internet of Things' (IoT). The connected car is a stand-out example of M2M entering the consumer space and driving mass market adoption. At Jasper we see the majority of new cars being connected within the next four years and this space is at the forefront of IoT.

Another vertical to watch is security. That's both narrowband security – for example, simply monitoring if an alarm is going off – and also broadband security with video surveillance and commercial applications. ➡

"Form a dedicated business unit ... so when an enterprise calls it isn't handled by the same people who sell SIM cards for iPads."
Jahangir Mohammed, Jasper Wireless

Then there are traditional M2M areas that have been around for a long time but are seeing a real acceleration of growth now – areas like smart metering and point of sale systems.

Another category of IoT where there is lots of buzz is consumer electronics. Recently, we have seen the likes of connected gaming devices and consumer medical devices being developed and taking off. However, it's important not to take too narrow an approach here. We see more than 20 vertical markets where enterprises are investing in and delivering on M2M.

I notice that most areas you list are ones in which it is easy to identify the value M2M can add to the enterprise. For instance, connected cars, M2M security applications and healthcare have a clear business case for insurers. How important is it that M2M demonstrates it can add value in attracting enterprises to invest?

JM: It's true that for some verticals there is an easily demonstrable benefit for the end user or the person selling the proposition, but the benefits of automating operations using M2M can be a little more buried in other verticals. The M2M industry is now at a stage where people at the leading edge can educate people in other verticals. There are many, many more latent opportunities for M2M.

What do enterprises need in order to be successful with M2M? What is holding them back?

JM: First of all, enterprises often claim that M2M deployment is easy. There is a tendency to say: 'Let's develop an application on the server side and then deploy it on a SIM card or modem.' But it's easier said than done: the pragmatics of making it all work at a large scale are deeply complex.

The main complexities come in two forms. The first challenge is connection management – simply ensuring that the wireless device works reliably as it moves from place to place without running up charges through activating and de-activating. If the device doesn't work, calling the carrier doesn't help because it is not a phone number.

The second group of challenges that need to be addressed encompass automation of the processes within the enterprise. If a business employs people to manage business processes within the

enterprise, that becomes a substantial cost and can make the project unviable. They need to automate deployment and management of M2M for it to be successful.

At **Jasper Wireless**, we identified that if these two areas of complexity could be solved, the scalability and reliability would be substantially improved. However, once we started the company we recognised that a third challenge existed.

Global enterprises want to scale the business and deploy systems across the world, yet it is impractical for them to work with many carriers in many countries with different interfaces. Anyone who can simplify this substantially reduces the barrier to entry, so that's where we focused.

What do operators need to be successful with M2M?

JM: M2M cannot be an afterthought. Operators should form a dedicated business unit with dedicated salespeople who really understand M2M, so when an enterprise calls it isn't handled by the same people who sell SIM cards for laptops or iPads.

Another important factor, especially for larger operators such as **AT&T, Vodafone** or **China Mobile**, is their role in promoting the market and enabling the market to grow. Some do this really well; I'd single AT&T out as an example. There are multiple opportunities for operator executives to develop the market by putting propositions to the right people.

The third piece is always keeping the enterprise in mind and enabling them to be successful. Operators should make use of a third party software provider because trying to build their own software products in-house is a misplaced effort. There are software companies dedicated to creating these services, and operators can benefit tremendously by making use of this expertise and experience.

I must emphasise that this is not a one-time develop-and-it's-done situation, so operators really do need to find a software partner that will continue to innovate and help them grow the market.

It is essential to continue learning from the market what the enterprises need and feeding that back, ➔

> "Connected cars are probably stealing the most limelight in the excitement around the Internet of Things."
> **Jahangir Mohammed, Jasper Wireless**

hence why at Jasper Wireless we have a software release cycle of three weeks. We certainly discover new needs each week and I see that innovation cycle continuing over the next 10 years.

What are the biggest innovations you see coming into M2M from operators to grow the market?

JM: We're seeing fantastic innovation both within the operators and the VAS software partners. And that innovation is not only on the technical side – operators can break new ground with their price plans for example. The ability to understand the model of the industry and to align with the economic interests of both the operator and the enterprise is vital for success in M2M.

Operators have great scope for innovation when it comes to connected things – they're not locked in to saying there are only three price plans available. Leading the way in IoT are those operators that are willing to innovate on price plans that fit with the overall operating model, integrating the various business units and solutions engineers.

Connected cars are probably stealing the most limelight in the excitement around the Internet of Things. We see content producers delivering content to the dashboard and using a single billing interface provided by the operator. The connected vehicle is a rich breeding ground for creativity.

Do you think the M2M market has become mature enough to recognise that there are multiple types of company in the M2M market and each has a significant role to play?

JM: There are multiple players in the ecosystem but the industry has evolved in a reasonable fashion whereby it doesn't require the parties to work together or interoperate – that's been accomplished with the **GSMA** standards. What the application developer, software platform, operator and others do, and therefore what consumers get, has fallen into place and seems to work well.

Some of those lines are fuzzy and that's to be

expected – when you occupy a particular layer in an industry you tend to go down or up from your core position as you grow. But, overall, I would say the ecosystem is working fine.

What about smaller markets? Certainly, it's easy to see investments in the US, the UK, Germany and China, but smaller and developing markets seem to have less opportunity in terms of scale.

JM: At the highest level I see the IoT as comparable to the mobile industry. At the turn of the century, the mobile industry in the US was just coming to the mainstream and the question was whether people in emerging markets would ever have a cellphone. It sounds like a strange question today but at the time it was completely legitimate. Now, of course, just about everybody has a mobile phone and I believe this parallel applies to connected devices as well.

Everything that carries information gains by being connected and it doesn't matter if it's in Indonesia or the US. Some will make the argument that labour cost in some emerging markets is so low that it's more logical to send someone to physically read a meter and I understand that argument. However, it ignores that the value comes from the real-time capability of connected devices. Getting that information in real time adds value that can't be achieved by people, only by automation.

Is it the wider understanding of that real-time value that is finally making the M2M market a reality?

JM: We're certainly in a growth phase now. As an industry we made some bullish predictions in the past about how fast the space would develop, but even then we knew this boom would be inevitable and we hold that belief still. In the last 18 months we have really expanded and now Jasper Wireless solutions are powering the Internet of Things across more than 100 mobile operators, 2,500 enterprises, millions of devices and six continents. The market potential is still enormous and we are looking at a future of even more rapid growth.

M2M Now Jargon Buster

IoT = Internet of Things

VAS = Value-Added Service

Don't miss the boat!

If mobile operators are to take advantage of the predicted growth in connected devices, they need to act now. Steve Rogerson looks at the challenges they face.

Though there is no doubt that the predicted massive growth of the Internet of Things (IoT) and machine-to-machine communications (M2M) is a great opportunity for mobile operators to gain new business, and one that they relish, it brings with it a number of challenges that the operators must meet in terms of both technology and support for their customers.

A network of billions of small devices each transmitting tiny amounts of data is very different in terms of service and billing needs than one of ➜

Stein Soelberg: "The mobile operators don't always play so well together."

"Devices are installed in far-flung places such as on oil or gas pipelines, or on trucks, or within the Arctic Circle. Operators ... need to find ways to carry out remote troubleshooting."
Stein Soelberg, KORE

human beings with smartphones; one smartphone will typically transmit and receive more data than thousands of M2M devices combined.

Nevertheless, each of those devices is making regular connections to the network and signalling, and that takes up resources even though the amount of data is small. Most networks have enough capacity today to handle this, but if the IoT grows at the rate some are predicting then there is a time limit.

Enough network capacity?

"There is enough capacity on the networks to handle that now," said Macario Namie, vice-president of marketing at **Jasper Wireless**, "but maybe not in three years' time."

Stuart Orr, managing director for the communications industry at **Accenture**, thinks the natural evolution of mobile networks will provide the capacity anyway to handle the growth in M2M applications.

"The existing networks probably will be able to cater for it," he said. "There are potential opportunities to use some of the low-use times on traditional networks for M2M. And 4G and 5G and beyond will provide additional capacity. They will need to use the networks to their capacity."

Tim Last, director of M2M services at satellite services company **Iridium**, thinks that even where

the network is not ready, that most of the operators have this aspect covered. "They have platforms in various stages of development," he said, "and can manage the predicted growth and explosion."

He said Iridium's M2M business was growing at about 20% a year, which meant adding tens of thousands of subscribers each quarter. "Up until now, we have grown our IT and management systems predominantly in-house," he said. "We are now at a crossroads because to manage that growth we have to do something different."

So far, the largest M2M customer had around 25,000 subscribers, said Last, but customers in the pipeline have hundreds of thousands of subscribers. "We need a platform to handle that," he continued, "and it has to be scalable. We are part-way through the process of finding a platform. We know we have to do something."

However, he was critical about some of the companies pushing service delivery platforms. "They are trying to put the fear of God into people," he said. "They are developing technology and throwing it at the market."

Data analysis

An aspect of M2M that needs to be considered is the speed of data analysis. For example, take smartphones with shopping profiles stored that can be accessed by shops as the owner passes. One idea ➡

is that the shop can then send a message to the person's phone with a special offer for them if they enter the shop. This, though, needs to be processed quickly.

"They need to send the offer before they pass the shop," said Orr. "There has to be speed in making a decision and speed in action to get a successful business outcome. They may have to handle vast amounts of data and analyse that."

Orr said this was part of a move away from transactions to interactions. "You need to build more valuable interactions with the customers. They have to take the M2M data and make them more personal."

Billing and support

Operators also need to service this market in a profitable way, but the billing models they are used to with smartphones just won't work. These have been designed to support voice and data plans that are specific to smartphones. Now, they need to pool data plans across thousands of devices and manage that efficiently.

"This is a low ARPU business," said Namie. "The business is fundamentally different. It is a very different model for customer care and support. Everything from customer care to billing has to be rethought to make it highly profitable. It can be highly profitable, and we have already seen this, but

you need to automate everything."

Last added: "With a voice subscriber, you are talking about 40 to 60 bucks a month but a smart meter might bring in just a few cents, so you can't rely on the same model, otherwise you will die under the growth."

The change also applies to technical support. One example is the type of query that support desks will receive from customers. Generally, the customer will be more technically knowledgable and will be talking about faults on a network of many devices.

"You can't just reset it if there is a problem," said Namie. "It is a much more complex environment. And much harder to diagnose remotely as some of the devices will be in parts of the world where the network hasn't had much investment."

Stein Soelberg, marketing director at **Kore Telematics**, added: "One challenge is that it is a very different support requirement compared to your typical smartphone consumer plan. In many instances, devices are installed in far-flung places such as on oil or gas pipelines, or on trucks, or within the Arctic Circle. Operators are not geared to support that type of business model. They need to find ways to carry out remote troubleshooting."

Another problem is making sure that all the devices on the network are compatible with the network ➔

Macario Namie: "All it takes is some hiccough up in the network for some of these devices to start behaving badly."

Some devices seen on the networks were poorly built and became aggressive, taking down network elements and crashing systems. This is likely to become worse as the IoT grows.
Macario Namie, Jasper Wireless

Stuart Orr: "There has to be speed in making a decision and speed in action to get a successful business outcome."

Tim Last: "They are trying to put the fear of God into people. They are developing technology and throwing it at the market."

M2M Now Jargon Buster

ARPU = Average Revenue Per User

and are not going to create technical problems. With smartphones, this is relatively straightforward as there are about half a dozen companies making 95% of all the smartphones.

"These companies are very good at building data devices for the mobile networks and the devices know how to behave," said Namie. "With the IoT, for every 100 devices there will be 100 purpose-built devices from 100 different companies that are not mobile device experts."

He said some of the devices he had already seen on the networks were poorly built and became aggressive, taking down network elements and crashing systems. This is a problem that is likely to become worse as the IoT grows.

"The networks and the network operators need to evolve to deal with this," said Namie. "All it takes is some hiccough up in the network for some of these devices to start behaving badly."

As an example, he said to consider a device that sent regular information to a company server. If, as can happen, the server goes down for a time, the device can no longer establish a connection. "Rather than wait, it just keeps trying over and over again, sometimes 150 times a minute," he said. "And there could be thousands of devices trying to make the connection. This can cause tremendous harm to the network."

The solution, said Namie, was for the operators to work closely with the network equipment manufacturers to work out the correct behaviour when this type of incident happens. "The long-term future is one of education," he said, "so they know the kind of behaviour they need. A mobile network is more temperamental than a fixed-line Ethernet connection, and they have to learn how to deal with that."

Jasper's Namie added that there was an opportunity for some form of standards, but these take time to write and become verified plus it is difficult when, as with the IoT, the use cases are so varied. The USA is a bit more advanced than Europe in that it already has three layers of certification that need to be met

before a device can go onto the network.

Orr said that networks must also invest in fault-finding equipment that can analyse the data flowing through the network and react proactively if something is going wrong. "They need to work out how to recognise a fault in the network," he said, "and react before the customer raises the issue."

Network changes

In North America, M2M service providers are facing another hurdle. Many of the installed devices are using the 2G network and are geared to do so. But AT&T has announced it will be closing its 2G service early in 2017 to use the spectrum for 4G LTE. It is expected that other operators will follow suit.

"There is already a lot of angst in the market because a lot of the devices will have to be replaced or the SIM card replaced for one from another operator," said Soelberg. "Some carriers have said they will keep their services until 2020 or 2025, but 2G will go away. The question is when. We have not seen that in Europe."

As a result, Soelberg believed that new installations would avoid 2G in North America. For those offering global M2M services, finding roaming agreements and technologies that can handle the different types of networks will be tricky.

"The mobile operators don't always play so well together," Soelberg added. "There is a real fragmentation in terms of standards and frequencies. If you are a global application provider with a fleet device, it will need four or five different radio frequencies built into it. And the carriers will need to come together to offer compelling roaming agreements. I don't want to have huge bills when I leave my network."

Conclusion

In summary, while operators are handling the M2M growth at the moment, they need to be putting in technology and management plans now if they are to be prepared for the predicted massive growth in connected devices. There are big opportunities approaching, but those who are not ready may miss the boat.

David Hicks (left) is vice-president of Oracle's Worldwide ISV, OEM, and Java Business Development. In this capacity he is responsible for business development and marketing between Oracle and its top worldwide Independent Software Vendors, Original Equipment Manufacturer and Java partners to increase Oracle's activity with those partners, while maximising the partners' business to their end users.

IoT will create unusual alliances as companies learn to tackle location and new user behaviours together

It's no secret that Oracle offers a wide-ranging platform for M2M architecture. From the Java platform to embedded data management systems, by way of back-end databases and big data analytics. With such a broad view to share, *M2M Now* sought out David Hicks of Oracle to get a better idea of where we're heading with IoT.

M2M Now: Does the Internet of Things (IoT) need a common industry architecture to be truly ubiquitous? Since this may only happen by agreeing common IoT standards, is the industry going to achieve this without delaying IoT service roll-outs?

David Hicks: No, I don't think there needs to be one common industry architecture to roll out IoT and be successful.

However, by agreeing on common standards, the degree of interoperability will go up and that can ➔

increase the value and potential of IoT exponentially. However, IoT is already building on top of existing standards such as TCP/IP, REST, XML, etc. and this already opens the door to growth and success.

Just like every other technology wave before (client-server, internet, online banking, SIMs, apps), there will be lots of things tried before the market settles into more predictable patterns and thus standards (de facto or designed). IoT becomes truly ubiquitous in this phase.

What other API and integration work needs to be done so that IoT hardware and software from various players worldwide can interconnect and communicate seamlessly?

DH: Common data formats and an API language for talking about data in new ways needs to be established. In the IoT space, data will always have a provenance, a context, and a date because all of those things combine to increase its value.

Therefore, data models will need to be developed to provide more context (meta-data) about data or analytics derived from some set of data. As well, APIs need to be clear about what questions a device can ask of a network and vice versa. APIs will need to be set that allow devices and entities to discuss security, available services, acceptable behaviour, and so on.

Setting a common context for data and meta-data

types as well as basic 'questions' about what something can or cannot do will help IoT proliferate. Then more sophisticated capabilities will quickly build up and will become *de facto* standards.

One thing is certain about the IoT, and that's the enormous growth in data that the industry is going to have to manage. What are the challenges here for the M2M / IoT industry and how can Oracle help?

DH: There are several data challenges. The first is collection – how to gather and aggregate data from many sources. The second is analysis – how to analyse that data and store the results in business-usable formats. The third is capacity – how to store vast amounts of data so that new analyses can be done at a future time when new questions or analytic capabilities emerge. And the fourth is data lifecycle.

Some data has value for only minutes or hours and then is best aggregated into some other form. For example, I may want to capture the temperature of my refrigerator every five minutes so that I can keep an eye out for failures. Typically, the temperature doesn't vary much at all – so each individual data point is only useful over the period of a few hours after which I'd rather work with the average temperature per hour and after a few days it's probably the average temperature per day, then week, then month and so on. So there's an inherent lifecycle where an individual piece of data ➔

> "I may want to capture the temperature of my fridge to keep an eye out for failures."
> **David Hicks, Oracle**

has a lifespan and is then processed into another piece of data, and so on.

Managing and architecting solutions for the above is a challenge for companies. Generalised IT models are a good starting point, but ultimately you need domain expertise. This means service companies need to work with their customers and design potentially a custom solution for each one. As well, where the data is stored is a key question. There are many 'way stations' for data in the course of a natural monitoring or managing evolution. How long is spent in what application or storage vehicle needs to be sorted out.

Oracle offers solutions to these providers by pre-integrating solution components, which make it easy to move data from one place to another. This provides the flexibility. On top of that, we have engineered systems which can easily and quickly scale to offer maximum performance and vast scale which is often needed. Finally, our expertise, reliability, central manageability, and security are unmatched in the industry – and we continue to invest in R&D to keep moving in a rapidly changing industry.

Since the Internet of Things will be made up of various industries, each with many applications, is it possible yet to see which industry verticals will lead the way in deploying IoT applications? Which industries will be early adopters and why, and which ones will make up the second rank?

DH: Achieving cost savings has been a significant driver in encouraging companies to invest in IoT over the past four to five years, even in a down economy. There are just huge sums of money to be saved by eliminating waste in products or processes and many of those savings are relatively easy to access.

I think every company dabbling in IoT also has their eye on the future, as IoT implementations pave the road for ongoing savings as well as market opportunities for smart businesses. However, as the value of that work is in the future, there's less momentum until a few leaders demonstrate how their work actually leads to a hugely larger market opportunity.

One area where we see success is in the home automation market – where kits to enable home automation are readily available in the West from carriers or even big-box home goods stores, as well as in the app stores for smartphones. Another area is in industrial automation, as IoT is another point on the line that most manufacturers have been following for the last decade and more by improving automation and JIT manufacturing processes.

Smart grid/smart energy is moving quickly via green initiatives sponsored by various local and national governments. There are some larger challenges around security and interoperability here so it's not moving as quickly as some of the other areas. Similarly, healthcare is very active but also has ➡

> "Smart grid/smart energy is moving quickly via green initiatives."
> **David Hicks, Oracle**

Just like every technology wave before - including online banking - lots of ideas will be tried before the market settles

"As you walk into a conference room, your phone automatically mutes and puts up an 'I'm in a meeting' message. The possibilities are endless."
David Hicks, Oracle

M2M Now Jargon Buster

A/C = Air Conditioning

API = Application Performance Indicator

B2B2C = Business-to-business-to-consumer

B2C = Business-to-consumer

IoT = Internet of Things

JIT = Just-in-Time

M2M = Machine-to-MachineUser

security and regulatory issues that they must address before wide-scale roll-outs. But in every area there are several success stories that can be pointed to.

I think every industry has their eye on IoT – I think what distinguishes them at this point is the difficulty of the solution more than the desire to put solutions in place.

The Internet of Things is bound to change the way businesses interact with their customers, to deliver new levels of B2C and B2B customer support. How does Oracle expect this to change today's customer service solutions and processes?

DH: Probably the biggest change is in predictive services. I think every company today is collecting more information about you and is targeting you with better offers and so on. But the ability of IoT to integrate environmental, procedural, and inferred behavioural data together in a very fine-grained way means that we can cross the chasm away from taking care of our things and having our things take care of us.

By this I mean there are new service potentials available via not only B2C but more like B2B2C models. Integrating location data not only from your phone but perhaps from your car or your office building enables you to define behaviours for your things and your environment.

A simple example is you getting up for work and heading out to drive to the office. Of course, your phone transfers call control to your car's bluetooth setup using in-car microphone and speakers. But what if it also gives the car a heads up that you have a meeting scheduled during the drive so that the car can put the meeting participant names (or

pictures) up on the infotainment system? If someone important to you calls during the conference call, the car's heads up display flashes that for you on the windscreen and you can signal to the car that you'll take that call or not. Once you park and enter the office, your phone notifies the building that you're there and your office lights go on and A/C starts up to your requested setting. As you walk into a conference room, your phone automatically mutes and puts up an 'I'm in a meeting' message. The possibilities are endless.

These scenarios aren't difficult technically – but they do require a degree of co-operation amongst very different parties that haven't worked together before. But what's interesting is that there are some new elements of 'location' and new behaviours that can be assigned (or taught) to both your devices and to the environment. There are implicit and explicit agreements covering who shares what data with who and what they can do with it – but notice that most of the data exchanging is happening between things; your phone and car; your car and the garage; your phone and the conference room. Since each of these entities must be able to make some basic decisions, there must be intelligent gateways (low-cost but computationally capable) spread throughout an environment. Each of these gateways needs to refer to central servers to seek updates, permissions, requested data, etc.

Oracle delivers a comprehensive platform for the entire M2M architecture. From the Java platform to embedded data management systems, from back-end database, big data technologies, middleware and analytics technologies to extreme performance hardware that turns data into insight, Oracle is the only company that offers an integrated, reliable, and secure platform to meet your IoT and M2M needs today and into the future.

It's free to be included in The Contract Hot List (below), which shows the companies announcing recent contract wins or product deployments. If your contract is not listed here just email the details to us now, marked "Hot List" **<j.cowan@m2mnow.biz>**

Vendor/Partners	Client, Country	Product / Service (Duration & Value)	Awarded
ARM®	Telenor Connexion, Sweden	First connected business solutions provider to offer end-to-end ARM IoT technology globally	10.2013
Astellia	Orange, Moldova	Deal to provide 4G analytics services and support of network quality enhancements	9.2013
AT&T	GE, USA	Global alliance to enable wireless connectivity for 'industrial internet' via global network & cloud	10.2013
Atos Worldgrid	GrDF, France	Three-year deal in excess of €10m to handle integration of 11 million gas smart meters	10.2013
Capgemini	GrDF, France	Contracts worth €23m to install information system for 11 million smart gas meters by 2022	9.2013
Ctrack	Network Catering Engineers, UK	To develop and implement advanced vehicle tracking system for 61 vans working UK-wide	10.2013
Evolving Systems	Unnamed multi-national carrier	Global, pre-negotiated group-licensing enterprise pricing structure for Dynamic SIM Allocation™	10.2013
Gemalto	Imprimerie Nationale, France	Deal to embed microprocessors for contactless reading & verifying of electronic driving licences	9.2013
Gemalto	Imprimerie Nationale, France	Contract to secure and personalise ePassports and eResident permits	9.2013
Green Energy Options	RWE npower, UK	Selection of geo Duet II Smart Energy Display to engage customers with energy efficient homes	10.2013
Kamstrup/VIKO	EnerjiSA, Turkey	Smart meter pilot to test system performance for a potential 9m metering points	10.2013
Kamstrup/VIKO	Turk Telekom Group, Turkey	Partnership tests OMNIA smart grid platform for network comms, data management & meters	10.2013
Novatel Wireless	DigiCore Holdings, SA	Cellular self-installing OBD-II vehicle insurance telematics devices working on MT 3060 platform	10.2013
Numerex	John Deere, USA	Selected to provide supply chain optimisation services via M2M technologies	10.2013
ORBCOMM	Doosan Infracore Co, UK	Deal to provide telematics to track, monitor and analyse global construction fleet	9.2013
ORBCOMM	John Christner Trucking, USA	Contract to supply two-way tracking and monitoring for fleet of refrigerated rail & OTR trailers	9.2013
ORBCOMM	Ryder System, USA	Telematics deal on 30,000 trailer fleet (temperature-controlled cargo compliance safety regs)	9.2013
Philcomm (Simoco)	Brisbane College, Australia	GPS tracking of vehicles and staff across 5 college campuses with more than 25,000 students	9.2013
Sagentia	Senseonics, USA	Partnership to develop connected health glucose monitoring iphone app	9.2013
Silver Spring Networks	EDP Distribuição, Portugal	IPv6 network platform project expands for smart metering and distribution automation	9.2013
Simeio	JS Wright & Co, UK	Providing Site Roster Control on devices to monitor working hours across 8 locations	9.2013
ThingWorx	Camgian Microsystems, USA	Quantus platform for sensor-enabled ops, consumer trends, asset/inventory location & energy use	10.2013
Vodafone	Amazon, USA	Single M2M SIM empowers Amazon Kindle Fire HDX 4G LTE with Vodafone Internet Starter Pack	10.2013
Wirecard AG	CorFire, USA	Collaboration to support near field communications and mobile payments in Europe	10.2013
Xively	Turbid, Australia	IoT platform deal for next-generation storm water treatment solution	10.2013

Key: **IoT** = Internet of Things
OBD-II = On-Board Diagnostics II (vehicle diagnostic system)

More information on all these and other News stories can be found at www.m2mnow.biz

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CONTRACT NEWS

Capgemini in €23m deal with GrDF for the largest smart gas meter deployment to date

Hervé Griffon

Capgemini has won the contract to develop the information system for the new Gaz réseau Distribution France (GrDF) smart gas meters destined for 11 million French homes. In the largest roll-out of smart meters to date, starting in 2015 with completion by 2022, the technology will provide GrDF customers with real-time knowledge of their exact energy consumption, enabling them to monitor and control their bills more effectively.

An independent subsidiary of the GDF SUEZ Group, GrDF is the main French natural gas distribution system operator. It also operates Europe's largest network of 194,600 km of gas pipes. The company will also run the meter data management system that operates indexes, calculates consumption, controls meter readings quality, and transmits them to the billing systems.

Hervé Griffon, associate director with Capgemini's utilities sector, said: "Our offer is based on solid experience acquired over 10 years of running projects for dozens of utility operators in Europe and the US."

Ryder's 30,000 trailer fleet equipped with ORBCOMM telematics

ORBCOMM has developed a telematics solution for Ryder Systems Inc, featuring advanced data reporting and analytics capabilities to increase in-transit visibility and the security of more than 30,000 dry van, refrigerated and flatbed trailers.

Connectivity hardware and a web-based analytics platform aim to make it easier for Ryder's customers to monitor their assets in real time, maximising visibility and utilisation. The technology can also handle refrigerated trailer monitoring and control for cold chain customers to improve quality, mitigate product spoilage and ensure compliance with food safety regulations.

More than 2,000 systems have already been deployed on Ryder's trailers and this will be extended to commercial lease and rental customers as a value-added benefit.

Ctrack vehicle tracking for Network Catering Engineers

A provider of integrated engineering and maintenance systems to the catering industry, Network Catering Engineers, has appointed Ctrack to develop and implement an advanced vehicle tracking system across 61 vans in its UK fleet.

The company will use the web-based tracking tool 'Ctrack Online' to enhance fleet utilisation, reduce operational overheads and minimise customer response times. Providing added visibility and control over the company's engineering team that services customers nationwide, the solution will also support reactive and proactive planning and scheduling across all equipment breakdowns, planned preventative maintenance and equipment installations to help make best use of available resources.

What happens when M2M grows up?

There's a tipping point in the growth curve of many technologies when they break out of the closed domain of the specialists and into the wider world. We've all seen examples of new technologies – and more efficient ways of working and living – being hampered by clumsy marketing, arcane terminology and an inability by experts to see things from the user's point of view and explain the benefits in language that's relevant to customers. Alun Lewis reports from Scandinavia on leading edge experience.

For Robert Brunbäck, VP Marketing at **Telenor Connexion**, the specialist connected business solutions wing of the Telenor Group, our industry sector has now reached that critical stage when it needs to start turning outwards much more if it's to truly deliver its full potential.

"The market out there is now changing very rapidly," he says. "While there's continuing and growing activity in the classic base of industrial M2M applications, this is now being joined by a more rapid rate of take-up under the much broader Internet of Things (IoT) vision. As a result, solutions now have to be engineered that are able to reach directly into the consumer space and that can also reflect and enable both the brand values of the company using them and the lifestyle of the end customer or user. In this context, the increasingly ubiquitous smartphone is fast becoming an invaluable tool when it comes to supporting the seamless connectivity and advanced services that consumers demand. ➥

Robert Brunbäck is vice-president of Marketing at Telenor Connexion

"We've already got two very good examples of this approach," says Brunbäck. "Firstly, in the wellness area, we've partnered with **Telcare** – one of the key innovators in this field – who have developed a fully FDA-approved wireless-enabled blood glucose meter targeting the 100 million or so people worldwide who suffer from this disease and need fast, secure and reliable feedback if their blood sugar levels start to deviate too much. Telenor Connexion worked closely with the company to help them develop this life enhancing – if not actually life-saving – solution."

Brunbäck adds, "Secondly, on the home security side, we've been working with **Verisure**, part of the **Securitas Direct Group**, to allow people to use their smartphones to continue to remotely monitor their homes even when they're away from them. Our co-operation spans from technology solution design to operations across multiple markets. The Verisure journey is all about moving from being a company largely focused on security to one that's a true enabler of the Smart Home vision, where their intelligent connectivity hub not only manages alarms, but can also keep track of when the children get home from school, can open a door to the plumber remotely – and keep an eye on them – and even start heating up your sauna before you get home – an attractive application for Scandinavians! It's also an important step in creating one key building block that will contribute to making Smart Homes a working reality."
Given its long history as a pioneer in the area of 'connected things', it is logical enough that Telenor

Connexion should emphasise the importance of helping synchronise innovation and development across the entire the value chain. It can trace its intellectual history back over 15 years and, following a mix of mergers and acquisitions, was formally created as Telenor Connexion in 2008, migrating a number of customers across to its platforms from other members of the Telenor Group.

Telenor Connexion's latest acquisition, of Swedish M2M Cloud specialist **Iowa AB** in September this year also marks another shift in both its own strategy and that being followed by much of the rest of the ICT sector.

Brunbäck explains: "On top of those standard requirements of a device connectivity platform – reliability, security, coverage and easy front and back integration – there's also an increasing need from many of our customers to get to market as quickly as possible to differentiate themselves in their own target markets. Often, their own M2M development teams will be working outside their own core IT operations.

"The kinds of culture needed to innovate rapidly and creatively, especially where the world of smartphone apps and content are concerned, don't always fit well with traditional corporate IT organisations. This is extremely important if a company is making a strategic transition from a pure product play to one involving services aimed at enhancing ownership and enriching the ➜

"We want to make it easier for companies to get started and explore the possibilities in this connected space."
Robert Brunbäck, Telenor Connexion

The author, Alun Lewis, is a freelance telecoms writer

> **"Collaboration with technology companies such as Apple, TomTom and Microsoft has created new digital services that help Nike build loyalty and strengthen its customer relationships."**
>
> **Robert Brunbäck, Telenor Connexion**

customer relationship over the longer term."

He continues, "We want to make it easier for companies to get started and explore the possibilities in this connected space. We provide the expertise, tools and development resources right from the initial design stage, throughout implementation and rollout, and including the management of the complete solution over time into the future. It's therefore invaluable if there's a flexible and almost infinitely scalable set of solutions, APIs and supporting processes waiting on tap for them in our Cloud domain. Not only can they get to market quickly, but all the components involved are both well-proven and specifically optimised for connected services on a local or global basis. Once again, any issues here are instantly going to impact negatively on the wider brand and we clearly recognise that our customers' reputations are very much in our hands."

Brunbäck is also keen to emphasise the growing importance of open standards in this sector in cutting costs and time to market – but also the essential truth of much of the connected business solutions space in that each customer will require a different solution tailored to their own specific needs. In some cases these differences will be minimal – in others they will major.

"While it's obvious that the existence of open standards lowers the entry barriers for all concerned," he says, "the longer term benefits are going to accrue from sharing data with other entities and opening up new cross-industry collaboration models. Shoe giant **Nike** is just one example of how new technology can significantly add value and change the ways that customers

interact with brands. Collaboration with technology companies such as **Apple, TomTom** and **Microsoft** has created a new set of digital services that helps Nike build loyalty and strengthen its customer relationships. The new communications technologies of the last decade or two have helped break down numerous boundaries. The merging of the Cloud and M2M domains is going to help drive this sharing still further and bring benefits to companies and organisations that previously inhabited very separate worlds.

"Once again," Brunbäck adds, "the smartphone will play a crucial role in the end-to-end chain, adding rich visualised value to both personal and enterprise customers, helping them monitor, manage and interact with their devices, data and processes in truly personalised ways. Similar issues apply to other increasingly connected environments, such as cars, trucks and other plant. A lot of our R&D work is currently focused on this vitally important growth area, finding newer and better ways to interact with our customers and support their own decision making.

As ever with any vision, the devil does often reside in the data, and Telenor Connexion is focusing very heavily on finding ways to optimise and protect the ever larger volumes of M2M data flowing over its network and those of its partners. Most significant here was one announced at the end of October concerning an agreement with leading semiconductor firm **ARM** to license its Sensinode software – the first of its kind in the M2M area. Developed specifically to provide standards-based, energy-efficient and secure M2M services, this agreement builds on Telenor Connexion's existing use of ARM's Sensinode tchnology. ➡

Telenor Connexion plans to expand its portfolio of standards-based products and support IoT applications using ARM's IP technologies and its NanoService data management and Web application platform, developing connected business solutions that leverage ARM Sensinode technology and exploit key standards such as OMA Lightweight M2M, IPv6, TLS, DTLS, and CoAP.

"Any value chain is only as strong as its weakest link," stresses Brunbäck. "It's essential that you take a holistic view when developing connected services as you have to keep in mind the fact that most products being supported may have a lifecycle of up to 10 or even 15 years. Building a technology-agnostic approach – coupled with flexibility in the business model is, therefore, vital if customer solutions are to be supported and enhanced over time. Most of our customers start with quite a basic use case, but often end up using a far more advanced solution after a few years as they begin to understand the wider strategic advantage that it gives them. Our role is to spur innovation and ensure that our customers stay competitive through the use of connected services."

He concludes, "Many of our customers are also starting to see the benefits of connected services when it comes to supporting their own green agendas, cutting unnecessary transport and energy costs and moving towards the connected environments that will characterise the Smart Cities and urban spaces of tomorrow. At Telenor Connexion we believe that connectivity and smart use of real-time information is one of the key cornerstones of a more sustainable society."

Helsinki Harbour

Magnus Melander is CEO of B3 Connect Compute AB and founder of the Swedish M2M Enablers Alliance

Robert Brunbäck, Telenor Connexion: Small Nordic economies force local OEMs to focus on exports

Per Asmussen, Kamstrup's CEO: Co-operation with other specialist companies

Patrik Björkman, Maingate: Healthcare is one area where the region can continue to trail-blaze

Nordic M2M players benefit from partnerships, good education and global collaboration… But can they keep their advantage in the IoT?

Some of Europe's leading names in machine-to-machine communications (M2M) hail from the Nordic states, ranging in scale and activity from Ericsson and Volvo, via Telenor Connexion and TeliaSonera, to Maingate and Kamstrup. How are Sweden, Denmark, Norway, Finland and Iceland able to deliver M2M service innovations, growth and profitability that elude their much larger neighbours? What lessons can the rest of the world learn from them? And what will they do next?

Partnerships and collaboration are recurring themes in M2M success stories. In many respects, today's global mobile industry owes much to the early collaboration between the Nordic countries.

The Nordic Mobile Telephone system (NMT), a regional standard capable of supporting roaming, entered commercial service in Sweden and Norway in 1981 – a full decade before the launch of GSM. Adoption across the Nordic countries, and subsequently across large areas of central and Eastern Europe, created scale that gave both **Ericsson** and **Nokia** 'first mover advantage' in cellular mobile.

"The culture in Nordic countries is heavily built on co-operation and social equivalency, much more so than in other regions," says Blake Swensrud,

chairman and CEO of **Device Cloud Networks** (DCN). "This is reflected in public social systems and it extends to the business culture." DCN has built its own device management platform, owns a GSM network in Iceland and is looking to collaborate with tier two operators through its HUB Alliance to deliver cost-effective M2M services over a global cellular footprint.

The total population of the region is only around 25 million, but its strength in telecoms has been built on heavy investment in public education, science, engineering and IT.

"There is definitely a massive base of human capital with a vast array of skills in telecoms, courtesy of the likes of Ericsson and Nokia," says Matt Hatton, director of **Machina Research**. "There is a ➡

NMT, a regional standard supporting roaming, entered commercial service in Sweden and Norway in 1981 – a decade before the launch of GSM.

willingness and ability to develop M2M/IoT (Internet of Things) solutions which will find their test-bed in home markets first."

Hatton credits **Telenor Connexion** as a first mover in M2M, establishing a good global business before other telcos realised there was much of an opportunity. Similarly, he notes that Ericsson's Device Connection Platform is evidence of a strong software play in the region.

The innovative mindset extends into internet-based business models such **Spotify, iZettle** and **Klarna** according to Robert Brunbäck, VP of Marketing, at Telenor Connexion. And, let's not forget, the founders of **Skype** included a Swede and a Dane.

The Economist Economic Unit recently reported that the Nordic countries are world leaders in broadband internet connections, IT knowledge and IT investments.

For this reason, many companies use Scandinavia as a test-bed. "People are considered to be open to new ideas, curious and willing to try out new technologies and services," says Brunbäck. **Huawei, Intel, Motorola, Oracle, Symantec** and **ZTE** are among the foreign companies conducting research and development in Sweden.

Brunbäck also observes that the small size of the domestic Nordic economies forces local OEMs – which include car, truck, medical equipment and security product manufacturers – to focus on exports. "In order to keep competitive edge, some have been early pioneers in utilising connectivity for enhancing their core product." Volvo's collaboration with Telenor Connexion and Ericsson on connected cars is a prime example.

Small populations can also mean that labour is expensive so finding ways to automate systems through M2M is seen as natural, according to Hatton. An ageing population is another driver. Patrik Björkman, deputy CEO of **Maingate**, a supplier of smart energy solutions for the home, enterprise and grids, notes that technology is recognised as a way of delivering good services to all.

To date, public policy appears to have been a positive influence. The mandating of connected smart meters by the Swedish Government helped bolster the M2M sector by guaranteeing several million connections and nurturing an ecosystem according to Hatton. Brunbäck agrees: "We can now see a second wave where new services are developed on top of the new connected meter infrastructure."

Commending **Helsinki City Transport** as a good example, Hatton says that making public transport and other 'smart cities' data available to application developers – with minimal strings attached – attracts developers and helps create an IoT application ecosystem.

Magnus Melander, CEO, **B3 Connect Compute AB**, describes data as "the gold of M2M" and service enablers as the missing piece between the generic networks and the application where the information is analysed. "Companies need to be specialists to provide a proper context to the information collected, processed and distributed," he says. He founded the **Swedish M2M Service Enablers Alliance**, which currently boasts 16 members, to exploit the combination of available ICT skills, international outlook and "our peculiar consensus-style decision making."

A manufacturer of smart meters and smart metering systems, Kamstrup sees the ability to collaborate as vital. Even though the company offers a comprehensive portfolio, Kamstrup often finds that clients have legacy systems with which they must integrate. "The ability to co-operate with other specialist companies allows Kamstrup to offer more to its clients," says CEO, Per Asmussen.

The company has formalised partnerships with a number of other Nordic vendors including **Tekla** of Finland, Norway's **Powel** and Denmark's **Grid Manager**. However, partnerships in America show the company's horizon extends well beyond their home region.

But can Scandinavia sustain its leadership?

Brunbäck is optimistic. "As more things, people, and processes are connected, the value will increase exponentially if data is captured, managed and visualised *in the right way*."

Hatton is slightly more cautious. "When it comes to engineering and connectivity then Scandinavia can claim a lead. However, as things shift towards a more open and internet-like model – where the application developer is king – the focus is very definitely in the internet heartland of Silicon Valley."

Driven by the imperatives of its ageing demographics and often sparsely populated topography, Björkman sees healthcare as one area where the region can continue to trail-blaze. "The engineering heritage is one of the keys to this, we focus on it and it's our DNA." ★

Matt Hatton, Machina Research: Finding ways to automate systems through M2M is seen as natural

The author is Ian Volans, an independent consultant and writer with more than 25 years' mobile communications experience

Esteve Vallve (left) and David Pollington

Cycling for diabetes

In the largest group trial of its kind, more than 30 athletes recently cycled from Brussels in Belgium to Barcelona, Spain to research the effects of strenuous exercise on people with type one diabetes. Steve Rogerson reports.

Michael Trenell: "We have worked hard to bring all the parties together."

Thierry Zylberberg: "We want to make the statement that the technology is ready."

All mobile broadband technologies in the experiment complied with Continua Health Alliance guidelines for interoperability.

A research project at **Newcastle University**, UK into the effects of exercise for people with type one diabetes led to an ambitious trial involving more than 30 cyclists covering 2,100km (1,312 miles) as they travelled from Brussels to Barcelona during 13 days in September. The GSMA mHealth Grand Tour brought together numerous technology companies for the event, which was first discussed at Mobile World Congress in February.

The cyclists were split into three groups. Group one comprised professional athletes with type one diabetes, group two were amateur athletes with type one diabetes and the third group were amateur athletes without diabetes. Throughout the journey, all the cyclists were continuously monitored and information relayed back to the researchers using two different technologies.

HMM in Germany provided M2M modules that were carried in the saddle bag and **Orange** provided embedded software in a smartphone to send the information to the cloud.

"The M2M module and the smartphone are collecting the same things," said Esteve Vallve, project manager at Orange. "We wanted to use both methods as it is a pilot. The module is sending data back automatically but the smartphone needs some user intervention. We are trying to show we are ready to bring mobile devices into healthcare."

Continuous monitoring

A **Dexcom** continuous glucose monitor worn by the riders and sensors on their bike computers transmitted statistics over the ANT+ protocol to **Sony Mobile** handsets, so riders could track their own progress. The sensors also transmitted information to the HMM modules.

"They are picking up the level of effort that the rider is exerting," said David Pollington, technical leader of the tour. "A Garmin device is calculating the number of calories being burned. Different riders are on different diets to see how they respond."

The cyclists were monitored for two weeks before the event, during the ride itself and then for two weeks after.

"We want to find out how people can better manage high and low blood sugar levels," said Michael Trenell, the professor at Newcastle University who is leading the project. "The second part of the project is looking at mobile health, how readings taken remotely can be shared with healthcare professionals."

The data were available to the researchers immediately, and Trenell hopes to have the first report available from the project by Christmas 2013. "This is the first time anyone has tried to do this," he said. "We have worked hard to bring all the parties together. We hope we will be able to do more like this."

As to the future, Thierry Zylberberg, director of **Orange Healthcare**, said: "We want to make the statement that the technology is ready. People won't be able to hide behind the fact that it is complex and the technology is immature. Public health officials now have to do the next step and implement the technology."

However, he said it could still be 18 to 24 months before this led to serious implementations. "What I would like to happen is a pan-European large-scale experiment so we can measure the positive effects," he said. "I would like to see that in the coming months."

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Vital role for subscription management in securing the Internet of Things

Concerns have been voiced that the machine-to-machine (M2M) communications sector is not secure. Here M2M Now's editor, Jeremy Cowan, talks to Carsten Ahrens (pictured opposite) of Giesecke & Devrient (G&D) Division Server Software and Services 3S about M2M security and plans for the Internet of Things (IoT).

M2M Now: Giesecke & Devrient is probably best known globally for its work in banknote and security printing. Can you tell us about its work in M2M and particularly in service delivery?

CA: Yes, we're a leading international technology provider, based in headquarters in Munich, and 58 subsidiaries and joint ventures in 32 countries. We have three business units and, as you rightly said, this is Bank Note, Government and Mobile Security. The group reached €1.8 billion in sales last year.

The Mobile Security business unit provides products and solutions in the payment, secure communication and identity management sectors, and those include payment and SIM cards and server software such as SIM and Device Management, NFC, Mobile Authentication, and last but not least Subscription Management which is highly relevant for the machine-to-machine sector.

G&D is often considered to have co-invented the SIM card, by being the driving party in the very early days of standardisation, so it's not really surprising that we have also been driving the SIM card for M2M. We have driven the standards and commercial products for SIM cards to meet the requirements of M2M applications, in particular the environmental requirements for automotive electronics.

G&D is a market leader in the supply of M2M SIM cards in both plug-in form and solderable (MFF2) form factors, and also in our service software business. It is worth noting that our platforms manage two billion SIM cards on the planet, and that of course comprises the normal telephone SIM cards.

To cover the specific aspect of service delivery, we typically bring our solutions to the market via systems integration projects which today mostly focus on MNOs (mobile network operators) and banks. Through those projects we are providing SIM and Device Management solutions, NFC (near-field communications) payment solutions, Mobile Authentication solutions and also Subscription Management.

We have many contracts where we operate solutions for the customers, from remote or even on-site locations, where our staff are sitting at the customer site, but it's important to understand that over the past years we have substantially grown the business of managed services where the solutions are actually run from our data centres. We are maintaining four data centres globally, out of which we provide the services to the customers.

The SmartTrust AirOn solution is a key element for our M2M offering, and has been a big success story for G&D. To our knowledge there have been four commercial contracts for subscription management awarded and implemented thus far, and we have been awarded all of them. We provide all of those four contracts through a managed service.

M2M Now: You have described this new subscription management solution as a revolution for the SIM. In what way? ➡

*Carsten Ahrens has run **Giesecke & Devrient 3S GmbH** since the start of 2013. He brings to 3S more than 20 years' management experience in national and international telecommunications and IT companies, having completed his studies in electrical engineering and beginning his career as a software designer. Prior to his most recent position as CTO of **Funkwerk AG**, he served over five years as CEO in the German market for telecoms equipment supplier **Ericsson** and has worked at **Atos Origin**.*

CA: Well, maybe it's good to give some more background about the four commercial projects which were won. They are all in live service, and they range from 'classical' M2M Subscription Management projects where the prime target and customers are actually car manufacturers, which are one of the main drivers for M2M today. But other projects are focusing on consumer devices such as eBooks and tablets, and of course they carry a plug-in SIM as well.

SIMs have evolved over the last 30 years to meet the demands of the industry – for example, in cryptography capabilities, adding NFC interfaces, and more obviously in the last two years by size reductions. But also they have evolved to an M2M form factor for the automotive industry, for example our SkySIM CX family in 2FF and the MFF2 form factors for the surface mounted devices, the SMD devices.

Now with Subscription Management, a SIM card can be soldered into a device for life, and the Subscription Management services can then remotely activate it and, if so desired by an MNO, securely switch it to use a new set of MNO subscription credentials at any time over the air. That's really a paradigm shift because we are separating the SIM hardware layer from the SIM software layer, and it is now possible to administer a mobile network subscription at the moment it's actually needed. That can happen without even touching the SIM, so it's done over the air.

For embedded SIMs which go into a car module, this is an obvious requirement because it might actually not be possible to change the SIM which is included in a device which can be mounted anywhere in a car. So this is really the revolution of SIM logistics that we are speaking about for the mobile industry, and also for the SIM as much as for us. We talk about an M2M SIM for life and subscription changes through the secure OTA (over the air) management of credentials within that SIM card. This change is driven by the requirements of the mobile industry for connected M2M devices as well as the need to build M2M devices on a production line for the global market. The SIM cards or the modules are soldered onto the boards, then they are manufactured centrally, they can be shipped anywhere, and then the subscription can be activated anywhere.

M2M Now: Mobility is obviously one of the key challenges, and you've alluded to that, when providing subscriptions for connected services; what are the other difficulties and how is G&D overcoming them? →

Carsten Ahrens of
Giesecke & Devrient

"We offer our solutions such as subscription management as a managed service, it really reduces the upfront investment that the customer would have to take."
Carsten Ahrens,
Giesecke & Devrient

CA: Let me first give an example of what you have described as challenges with connected cars when exporting them, or maybe even when roaming. Obviously, GSM and 3G networks can solve many mobility problems for international roaming, but it's important to know that some countries' regulations do not permit permanent roaming, so subscriptions would have to be changed.

Some M2M services such as in-car entertainment may be very demanding of capacity, so there might be a need to minimise communication cost through the use of a local subscription instead of a roaming subscription. This is one of the central use cases that we have seen with G&D's SmartTrust AirOn subscription management platform which we provide on behalf of the MNOs who have acquired connectivity deals with the OEMs. So, we see mobility as an opportunity and not as a challenge.

For the other difficulties, we also find something which is worth mentioning here. To drive the broader adoption of M2M solutions, technology not just has to work, it has to be simple. But the solution comprises several components; the SIM or an embedded secure element, an M2M module or a device, the

device operating system and then the server side, which is the subscription management, or a device management platform as well.

In various projects G&D have solved the technical issues in proofs of concept, but more importantly also in the commercial projects I've been talking about. But the subscription management is not fully standardised yet. This still needs to happen so that all the players in the ecosystem who are investing in the technologies and solutions now can also be sure that those will also work in future.

G&D helps its customers to secure their investments in two ways. One is that we have been and will continue to be a key driver of the standards, both for subscription management but also for the modules, for the SIMs; and we will also secure forward compatibility of all our commercial solutions with the future standard, that's important.

Of course, as a driver of the industry we are working actively with **GSMA** activities on embedded SIM and subscription management for M2M, for example in a proof of concept with several automotive vendors and MNOs. We demonstrated that this year at Mobile World Congress. In addition, G&D is also driving the necessary international standards within the **ETSI** Smartcard Platform Group. We started shaping subscription management back in 2010 with some ground breaking work and trials with industrial partners such as **DTAG (Deutsche Telekom AG), O2 Telefonica**, and **Vodafone**.

M2M Now: What are the next steps for the M2M communications industry when connecting billions of consumer devices via the Internet of Things?

CA: For an industry to take off and reach such volumes of billions of devices the technology and standards have to be ready – we spoke about that. But also the users, consumers and enterprises need to see the benefit in the offering, and the adoption has to be very easy.

The M2M communications industry is still young and is identifying the business opportunities. We do see large potential in the connected car, in in-car entertainment solutions, but also in consumer data-centric devices such as tablets, eBooks, watches, and wearable computers. We have seen the launch of cameras with Android operating systems, also smart grids and metering and industrial ➡

appliances, but in healthcare too.

So far the MNOs are the key drivers as they offer communication solutions to the M2M markets, and they own the subscription and the contract, and the contract conditions can be enforced with secure subscription management. But OEMs are starting to drive the M2M industry by offering services which require devices to be always online.

M2M solutions are starting to cover the big data aspect of connected devices as well. We have all heard about the floating car data and we see some of these things already live, for example the **TomTom** HD Traffic solution. This is primarily data coming from the network side, not so much from the mobile device, but it sends information back to the consumer device which shows it on the screen.

It will be key that we develop low cost, scalable and secure solutions. The Internet of Things ARPUs will be a challenge to MNOs because they might be low in comparison to voice and consumer data traffic, in particular for industrial appliances, not so much for connected car and in-car entertainment where it can be large amounts of data. So we must find scalable solutions to manage M2M applications and the subscriptions they use. This is one of the reasons why we offer our solutions such as subscription management as a managed service, it really reduces the upfront investment that the customer would have to take.

M2M Now: The Internet of Things is going to bring with it huge security problems as well as business opportunities; how can you help to make a better internet?

CA: We all understand the need for secure solutions, especially in M2M appliances where impacts from malware or hacker attacks might be severe. The industry needs to recognise the potential value of billions of pieces of information and the processing of this big data for a wide range of purposes. This information needs to be protected by all means. We also need to make sure that machines cannot be manipulated without authorisation. Viruses, malicious code or identity theft are already an issue and may become an even bigger issue in future with billions of appliances connected and controlled via the networks.

All contributors to the M2M ecosystem have to recognise that security needs to be designed in from the start and not added later or as an afterthought. It's in G&D's DNA to build such secure solutions and design in security from the outset. There is much to learn from secure large scale networks such as the mobile network and its security concepts, and the

Internet of Things should be built on a secure foundation provided by an embedded Secure Element. Security, integrity and protection of data are essential requirements of mass market roll-outs and are provided through solutions from us including the SIMs, embedded Secure Element, but also TEEs – trusted execution environments – and that in combination with the respective server components such as SIM Device Management, TSM platforms and subscription management. G&D takes an end-to-end approach to the solutions we provide and we secure, that access is controlled, and the data which is sent across networks cannot be accessed, decrypted or manipulated.

M2M Now: Is there a further role for embedded secure elements and trusted execution environments?

CA: Yes, secure elements play a central role in securing networks today and in the future. Secure tamperproof hardware tokens which are designed to provide a secure foundation to complex systems have demonstrated that they are fit for purpose for mobile communications, and for the financial industries. Embedded Secure Elements are based on the same secure silicon chips and secure operating systems which are used in cards for the finance and mobile communications industry. We expect the embedded Secure Element to be the security anchor for the Internet of Things being present in all nodes with a wide area of connectivity.

But Trusted Execution Environments (TEE) are also evolving form another means to provide a secure foundation on which security can be enhanced – this is through the use of a secure processor with an application processor that is designed to process sensitive data and trusted applications. An example for a TEE is ARM's Trustzone®. G&D has taken a leading role in TEEs with last year's creation of a joint venture together with ARM and Gemalto which is called Trustonic.

G&D holds the first commercial contract with Symantec for Trustonic based TEE TSM services. The trusted execution environment can be remotely managed by our TEE TSM which is the first TEE TSM on the market. The design, development and processes around the production and remote management of embedded Secure Elements and Trusted Execution Environments are core strengths of G&D.

Security has been part of our DNA for 161 years and we do see large potentials with the emerging M2M market and with the security demands that come with it. Today we hold the pole position with our Secure Elements and Subscription Management solutions to address those potentials and needs.

M2M Now Jargon Buster

ARPU = Average Revenue Per User

M2M = Machine-to-Machine

MNO = Mobile Network Operator

OEM = Original Equipment Manufacturer

OTA = Over-the-Air

SIM = Subscriber Identity Module

SubMan = Subscriber Management

TEE = Trusted Execution Environment

TSM = Trusted Service Manager

The evolution of service delivery platforms

M2M's vertical industry silos are making way for the horizontal IoT

For the horizontally integrated Internet of Things (IoT) to succeed, service delivery platforms have to connect any device via any network. In this feature M2M Now examines how the common needs of applications are leading to the first proprietary application enablement and connected device platforms, and where we are on global standardisation.

Mohsen Mohseninia, Aeris: The emergence of SDPs or AEP2.0 will be inevitable

Phat Huynh, Telekom Austria Group: M2M Value generation and differentiation is no longer based on technology

Industry analyst, **IHS**, states that cellular machine-to-machine (M2M) connections will triple in just four years in its recent white paper entitled, *MNO Strategies in the Cellular M2M Market*. The analysis predicts that global connections will rise to 375 million in 2017 (up from 116 million in 2012), with a revenue tag of US$22.4 billion by 2016.

Sam Lucero, senior principal analyst for M2M and IoT at the research firm, said that to take full advantage of the M2M market potential, companies must include application platform services; and this is prompting the emergence of special M2M business units as well as the acquisition of M2M connection platforms.

Around the same time, key market drivers that will help push the installed base of cellular M2M devices to 500 million by 2018, identified by **Juniper Research** include increased open M2M ecosystems and improved cloud-based APIs.

From connection economy to application economy

While the uses for IoT seem limitless, getting the ecosystem to work harmoniously will be challenging. Mohsen Mohseninia, **Aeris'** vice-president, Market Development for Europe has no doubt that to allow for secure collection and management of ensuing data, from literally billions of devices across multiple networks serving millions of applications, the emergence of service delivery platforms (SDPs) or AEP2.0 (application enablement platform) will be inevitable.

In the short term, those most likely to succeed are developing platforms that connect existing, but disparate, systems in one location. "The need for such platforms will be even greater if we consider the cost-effectiveness of IoT solutions in the longer term. If we also consider the movement, from connection economy to that of application economy, then the applications' common needs are

leading to AEPs, resulting in more standards within the M2M sector," explains Mohseninia.

Already in operation, Porthos™ from **Wyless**, is a powerful, web-based, management platform that enables control over M2M solutions from any location. It simplifies network management, provisioning, reporting and forecasting, monitoring, and API integration, as well as billing. Acting as an overlay, to simplify connections between enterprises and mobile operators, Porthos™ is reportedly lowering the service and maintenance costs, easing network management and increasing customer RoI.

Security and subscription management

Giesecke & Devrient, an international technology provider, also sees that the wide range of diverse M2M applications is setting demanding requirements on horizontal SDPs.

Security, integrity and the protection of data are essential requirements that SDPs must support for the mass market roll-out of M2M applications, and of course the IoT. Security must be built on solid foundations in the different components in the ecosystem, such as: advanced SIMs, embedded security elements, and trusted execution environments.

Another critical capability for the SDP is the management of the subscriptions to be used by the M2M devices for wide area connectivity. "This capability is already becoming a 'must-have' in many scenarios when, for example, permanent roaming isn't allowed in some countries and when roaming data costs are too high," said Carsten Ahrens, group senior vice president, Division Server Software and Services 3S at G&D. The company, which won the first ever commercial subscription management contracts in 2012, has already integrated its service platform with several SDPs for M2M customers.

Meanwhile, Phat Huynh, director of marketing and operations at **Telekom Austria Group M2M**, said that as the basic technological challenges have already been solved, value-generation and differentiation is no longer based on technology but on innovative services and business models. As a consequence, M2M solution providers will focus on the business side and leave the technological challenges to specialists, which is where SDPs come in.

"SDPs help to leverage this trend and provide the most important functionalities together, that are ready-to-use for application designers and developers. On the other side, developers won't need to dig deep into firmware, communication protocols, or security concerns; they can simply use APIs and library calls to perform any task faster and more efficiently, much like SDKs for smartphone apps," said Huynh.

He warns, however, that when using SDPs, customers must be aware of the risks that come with being locked in to one provider. Open standards can help to reduce this risk but solution providers often fail to design proper service models throughout the lifecycle of a product or service (from purchase, to activation, first use, regular use, charging, billing, collection, upgrade and termination). The telcos, with decades of experience designing and operating sustainable service models, are able to use their knowledge alongside M2M services which could be the differentiating factor for providers of AEPs.

How far away is a global, harmonised service layer standard?

"With regard to the next steps to connect billions of consumer devices and the IoT, this is no small issue," said Edward Finegold, director in the strategy team at **NetCracker**, a subsidiary of **NEC Corporation**. "There needs to be substantial automation to make activation, configuration, and data collection from all devices seamless and cost-effective. This is the kind of challenge that the mobile industry has addressed extremely well, but it took more than a decade. In the case of the internet, it took global co-operation on a massive scale to define IP and make it work as well as it does. Now, we're combining the challenges of device activation at a massive scale, mega-scale IP networking, and application management and delivery on a scale that may never have been experienced before," he said.

Beating the standards drum is **oneM2M**, whose goal is to develop specifications that address the need for a common M2M service layer. It already has 270 participating members, including InterDigital, a wireless research and development company. Operational for 30 years, **InterDigital** has been active in the M2M standardisation area for about four years. Earlier in 2013, it worked with Sony on the development of M2M over an application platform as part of the long-term, joint venture, **Conveta**.

Jim Nolan, head of InterDigital Labs and EVP of research and development at the company, said that although the current lack of an interoperable standards-based platform is an obstacle to achieving wider application of M2M (and the transition to the IoT), it's not the only element. While it is necessary for driving down cost and developing interoperable platforms, if the market stays fragmented (regarding industry verticals and ecosystems) it won't ever be fully leveraged or experience an adoption curve as quickly as it could. InterDigital hopes to see the first version of standard specifications, regarding platform interoperability, emerge by the end of Q1 2014.

Sam Lucero, IHS: Companies must offer application platform services

Carsten Ahrens, G&D: M2M applications are settling demanding requirements on horizontal SDPs

Jim Nolan, InterDigital: If the market stays fragmented it won't be fully leveraged

M2M Now Jargon Buster

AEP: Application Enablement Platform

API: Application Programme Interface

IoT: Internet of Things

M2M: Machine-to-Machine

RoI: Return on Investment

SDK: Software Development Kit

SDP: Service Delivery Platform

M2M platforms to play critical new role in IoT

Jim Morrish,
Machina
Research

Just as the industry evolves from its vertical M2M heritage to a horizontal IoT, the requirements for software platforms are evolving. A new white paper published by Machina Research, a provider of strategic intelligence on the M2M, IoT and Big Data markets, explores how the M2M platforms space evolved to the current day status. Perhaps most interestingly, it identifies the need for a new kind of platform together

with the ideal functionality of such platforms.

To date, different kinds of M2M platforms have emerged to assist with the development and deployment of applications. However, the industry is now at a tipping point. The old 'stove-pipe' M2M application approach is giving way to a more integrated method to application development which draws from a wider range of data sources (including M2M connected devices of different types and also corporate and other IT systems) and

stitches them together with more sophisticated applications.

The M2M/IoT Application Platform provides the 'glue' which intermediates between application developers, M2M connected devices and a range of niche and specialised M2M platforms and wider enterprise IT systems. Referring to the dynamics of this new M2M/IoT world, Morrish commented: "In the world of the M2M/IoT application platform, the application developer is king."

Aeris enables M2M app data management and analytics platform – via the cloud

M2M application developers looking to improve how data is stored, processed, published and consumed, might want to consider a cloud-based approach that has recently been launched by Aeris Communications, the Made for Machines™ technology and service provider. AerCloud, a next-generation M2M Application Enablement Platform (AEP), provides data management and analytics functionality for M2M applications.

As the value of M2M data extends beyond just monitoring and control, sophisticated users are extracting actionable business intelligence from their M2M data – multiplying the value of their deployment in the process. Additionally, the eco system itself is undergoing an undeniable shift.

"As the Internet of Things (IoT) proliferates, more companies will be looking to use

cloud-based platforms and companies like Aeris, which offer a full-stack solution," says Carrie MacGillivray, vice-president of mobile services and IoT at analyst firm IDC.

"Data and applications are where the value will be realised. This will cause a paradigm shift in the IoT ecosystem. Vendors who are able to incorporate data and applications into their IoT story will be well-positioned for success" she says.

Eurotech to improve M2M application device lifecycle management

Eurotech, a supplier of embedded technologies, products and systems, has launched the Everyware™ Software Framework (ESF) 2.0 to give developers proven M2M building blocks and built-in remote device and application management.

The upgrade provides a cost-effective, flexible and IT-oriented device application framework to build the new generation of connected, smart devices and Internet of Things (IoT) applications. It provides complete device abstraction consistent

across all hardware interfaces including serial ports, USB ports, Ethernet, WiFi, GPS, cellular modems, Watchdog, CAN port, digital and analogue I/Os and others.

Designed to separate applications from the hardware underneath, ESF 2.0 easily leverages software developments across different hardware architectures, generations and devices. Coupled with modern protocols and Eurotech's Everyware Cloud integration platform, the framework helps companies focus on core competencies with instant
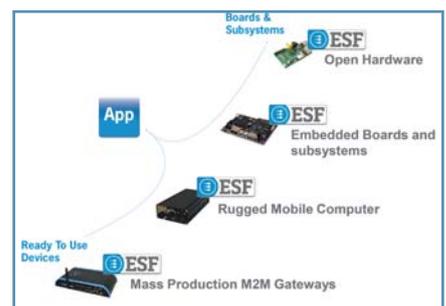
M2M cloud platform connectivity at a faster time to market.

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EXPERT OPINION:

The real deal on the Internet of Things

The 'Internet of Things' buzzword appears to have picked up steam during the past several months as large players such as GE and Cisco have touted their stories on the growing number of connected devices. But, as Alex Brisbourne of KORE asks, how different, if at all, is the Internet of Things when compared with other connected device markets, such as machine-to-machine (M2M)?

Alex Brisbourne is president and COO of KORE (www.koretelematics.com), "the world's largest wireless network provider focused exclusively on the rapidly-expanding machine-to-machine (M2M) communications market." He is a prolific speaker and opinion leader, and has become a staple at the semi-annual CTIA conferences.

When you boil it down to its elements, the Internet of Things (IoT) is, as it exists today, little more than an expansion of traditional telematics, security and asset control applications. If you look to the early days of stolen vehicle management, via **LoJack** and others, or basic tracking devices for children or Alzheimer patients, you know everything you need to know when it comes to the Internet of Things.

These devices communicate wirelessly with another device in the field, or back to a central server, to create value. But from these little acorns, oak trees of opportunity will flourish. The IoT really becomes transformative when devices start to communicate among themselves, disparate applications share and re-purpose data (think about your on-board car telematics data on how you are driving getting re-sold to the insurance company). It's not far away, and it is based in the bedrock of today's more laser-sighted applications.

But there is another story here. Recent IoT talk has focused upon consumer-facing applications; most have not received significant traction, from pet and teen trackers to wireless car starters. The trouble is that few have stopped to consider the long-term value proposition. For example, if we look at the connected car via brands like **OnStar** or **mBrace**, there is definitely a big question mark about the sustainability of their subscription renewals. The initial subscription is an easy sale because it gets bundled into the purchase price, but the shimmer appears to wear off and not enough consumers seem to be motivated to carry the service beyond an initial term.

The real challenge here is that consumer-centric applications will always fight for a tightly squeezed share of disposable consumer income. The value proposition can be exciting at first but most often loses luster over time unless it is providing long-term tangible value.

Home automation is another area worthy of closer examination. There are some points of value, such as turning off a light from afar, adjusting a thermostat or checking if you left the oven on. Locking the door remotely makes sense, but do we need our toaster to tell our iPhone that our toast is ready?

It's all about delivering value. Consider this: around 1 out of every 8 iPads sold today gets shipped with a cellular connection built in; but then, and this is the revealing part, only about 4% of those units have permanent subscriptions over time. If people aren't willing to keep their iPads permanently connected, as this data suggests, can we really expect they'll pay to keep their cars or their household lamps connected?

Ultimately, consumer-side IoT is going to have to conjure a "cannot live without" sentiment among consumers, in much the same way that cable television has done in most US households. Can this be done? Do they offer enough quality-of-life improving value for consumers to continue paying?

The rubber meets the road

On the commercial and public services side of the equation, the value is more evident. Going again to the connected car concept, vehicle manufacturers and leasing companies are designing IoT applications into their vehicles to provide remote maintenance monitoring, routing, fuel and mileage management, driver security, and other rich content. In these instances, the cost of integrating

the application is miniscule compared to the earning potential of the vehicle. It makes fiscal sense.

There are, of course, limits to the impact of the current wave of IoT applications. In Singapore, for example, the government is building a connected traffic management system, complete with sliding-scale road tolls based on time of day and traffic density. To do this, all vehicles are to be mandated to be equipped with on-board sensor devices. Such a concept can happen in a "command and control" society such as Singapore but when you talk about such mandates in North America, you get into a much different discussion. It is too big brother-like for cultural sensibilities, and needs investment in infrastructure that we appear to be reluctant to make.

There is, however, an interesting commercial version of this concept playing out in the auto insurance market, via "Pay-How-You-Drive" programmes reliant on vehicle sensor monitoring. You offer premium advantages by tracking policyholder behaviour more closely in real time.

In practice, however, we're seeing this IoT application play out more as a marketing opportunity for insurers, where they offer would-be customers a chance to "prove their deservedness" for the better rate. And it's not necessarily getting the expected results: we're seeing that these devices often remain in service for only a matter of weeks or months. Apparently, the parties are not realising the expected value and stop the programme short. Does this mean that no US driver drives safe enough all the time?

Society benefits from IoT

Let's now look at some other uses of the Internet of Things applications that stand to create real value, today.

Probably the biggest, and most powerful, use of the Internet of Things will be in telemedicine, and specifically for "wellness management", or actively monitoring patients 24/7. In places like the US and continental Europe, medical management is about controlling costs, improving patient quality-of-life and, as a natural corollary, elevating treatment outcomes.

If I were to rank the top health conditions where telemedicine is already playing a role, they would be active heart monitoring and blood pressure monitoring for at-risk patients; automated glucose monitoring for diabetes patients; prescription compliance applications to eliminate wasteful re-prescribing; and sleep apnea support for investigatory and direct courses of treatment. Telemedicine can minimise the need for expensive Polysomnography exams and reduce expensive overnight hospital stays.

When you start thinking about connected medical devices, the world of "what's possible" really does open up. In the case of prosthetic limbs, for example, embedded devices could deliver proactive maintenance alerts to patients and surgeons, as well as provide manufacturers with new information about how prosthetics "really" get used, what kind of wear and tear they experience and where the stress points are. The outcome here is to continuously improve how artificial limbs get made, optimise longevity and enhance wearability.

The Internet of Things also has a big role to play in helping to feed the world's ever-growing population. For example, connected devices already help farms manage and automate irrigation, monitoring soil moisture levels and weather conditions to provide the perfect amount of water right when it's needed. The supply chain actively measures time, temperature and air chemicals of perishables in transit to minimise spoilage. And, we see consumer versions of these concepts to alert home gardeners when individual plants need to be watered.

In Brazil, **John Deere** is programming its harvesters to use GPS and terrestrial data to help farmers grid the field for seeding, and to minimise overlap when cutting wheat. While it may seem small, an application like this delivers immense aggregate time savings, resource savings and field efficiency gains for farm operations.

Keeping IoT focused

There is truly no shortage of "futuristic" Internet of Things applications. However, there are also a myriad of IoT and more traditional M2M applications driving efficiencies and even revenue-generating services across vertical industries, from healthcare to fleet management to electronic payments.

The beauty of the IoT is that reliable and ubiquitous wireless connectivity from cellular, satellite and "near-field" networks is readily available and cost-efficient. I, for one, am excited to see the value-generating applications that will come to market in the next 12 to 24 months. ○

"Consumer-side IoT is going to have to conjure a 'cannot live without' sentiment among consumers."
Alex Brisbourne, KORE

EXPERT OPINION:

Paving the way to the Internet of Things

Combining the ARM computing engine with location-awareness and wireless connectivity

The author is Carl Fenger of u-blox

It's set to be the Perfect Storm: The rapid growth of high-speed cellular networks and the introduction of IP version 6 which has enough IP addresses for every grain of sand on Earth. Add to this mix the proliferation of the **ARM** embedded computing architecture, now the *de facto* global standard for low-power, high performance computing thanks to its successful integration into virtually all mobile phones on the market, including the iPhone.

The result is a perfect ecosystem for the rise of the Internet of Things (IoT), a world where every car, phone, sensor, meter, machine, sales terminal, sign, toy, camera, and healthcare device is wirelessly connected to the internet via high-speed connection. Add a GPS/GNSS positioning receiver, and you have a compact, always-connected, location-aware internet 'Thing' that possesses the computing power of an ARM processor with complete freedom of mobility.

The potential for new attractive applications is vast. Here are just four examples:

Remote metering and security

The Internet of Things will enable cost-effective and covert installation of web-connected devices that will wirelessly transmit utilities' usage data, report the location of pets and people, and provide 24/7 monitoring of vehicles, storage facilities, shops, and public facilities.

Surveillance of schools, airports, shopping malls, office buildings and healthcare facilities will become ubiquitous. Monitoring services can even be outsourced to security or healthcare firms located thousands of kilometres away, similar to the way low-cost telephony enabled the outsourcing of call centres.

Vending machines

Vending machines are a big business that will generate over US$190 billion in revenue by 2015, according to industry analysts. Already connected via wireless networks to report tampering or when a refill is necessary, or simply to report where the machine is located (a vending machines location is often forgotten!), cellular connectivity will bring multimedia advertisement and social media possibilities to vending machine displays.

Coca-Cola experimented with this concept in 2011 by installing networked vending machines around the world, allowing customers in different countries to interact with each other, and even "buy a coke" for a new friend thousands of miles away.

Telehealth terminals

As healthcare costs soar and the patient-to-doctor ratio increases, wireless networks will lower healthcare costs by enabling remote care via a high-quality video link. Instead of sick, elderly or far-away patients having to travel to the doctor's office, a mobile, location-aware telehealth terminal at home will provide instant access to a healthcare professional. This will give people greater freedom of movement and choice of where and how to live, significantly improving quality of life.

Car infotainment systems

Vehicle-mounted LTE routers will enable high-speed downlink of up to 100 Mbit/s (LTE category 3) to the car. This is enough to support five parallel high-definition TV channels, and more than enough to support the more typical mix of video, voice, internet access and social media applications used by passengers. Location-awareness facilitates delivery of position-relevant information such as multimedia enhanced navigation, or video-rich electronic 'tour-guide' services.

To help engineers jumpstart their design of IoT applications, u-blox and ARM have developed the C027 ARM mbed-enabled Internet of Things starter kit, providing out-of-the-box wireless internet connectivity based on a compact **u-blox** 2G, 3G or CDMA cellular modem (LTE coming soon) plus global positioning module.

The kit is powered by an ARM Cortex-M3 32-bit processor with cost-free access to the resources of the ARM mbed development platform. This includes a vast 'cookbook' of tested application performance indicators (APIs) for web, wireless, audio, sensor and peripheral interfacing.

Visit www.mbed.org for details. For information about the C027 Internet of Things starter kit, visit: www.u-blox.com/c027-internet-of-things-starter-kit.html ○

m2m now

Directory 2014

Welcome to the 2nd edition of the M2M Now Directory. This is a listing, in print and online (at www.m2mnow.biz) of key players worldwide in machine-to-machine communications (M2M), Internet of Things (IoT), near-field communications (NFC), and the deployment of embedded and connected devices for consumer or business users.

New companies are entering the market almost every day and there is a steady stream of mergers & acquisitions, as reported in the magazine and in our online news. All of which makes it hard to keep abreast of who is doing what in the market. So, M2M Now is once again publishing a list of solution vendors, system integrators, managed service providers, mobile, fixed and virtual network operators.

To give our readers access to a continually updated 2014 Directory this information is also published online at

www.m2mnow.biz/directory/. It's free to access this vital data; Just complete a quick and simple online registration form. You will then receive immediate and unlimited access to a reference tool that is unrivalled in the industry, and includes a searchable database of organisations that can be accessed by company name, type of service, or business application.

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Comarch is a global supplier of IT products and services for the telecommunications industry that has been present in the market since 1993. Comarch's areas of expertise include BSS/OSS, M2M and Cloud Service platforms, as well as a range of Managed Services.

The company's flexible solutions reportedly adhere to the best industry standards and have all been developed in-house. Having completed projects for over 50 telecom operators, Comarch has accumulated vast experience in the fields of designing, implementing, and integrating IT solutions. One of the company's main strengths is the loyalty of its customers, who include leading brands such as: Vodafone, T-Mobile, O2, E-Plus, MTS and KPN. More information can be found at: telecoms.comarch.com

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Gemalto M2M is a machine-to-machine (M2M) market leader for more than 15 years with award-winning Cinterion® products and services that allow machines, equipment, vehicles and other assets to securely communicate over wireless networks, helping enterprises simplify operations, increase efficiency and establish new business models.

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Inmarsat is a leading provider of Mobile Satellite Services (MSS) serving the machine-to-machine (M2M) market. The company works with a network of partners including KORE, ORBCOMM, Quake and Stream; reflective of the wide adoption of satellite communications as part of the M2M connectivity ecosystem.

Inmarsat's award winning, global network offers reliable, secure two-way, real-time IP data and 'store and forward' services designed for machine-to-machine connectivity – whether fixed, mobile or in unmanned environments. Independent of cellular and terrestrial networks, its satellite services operate alongside GPRS, 3G and 4G technologies, and allow M2M service providers to interconnect with Inmarsat seamlessly. For more information go to: www.inmarsat.com/m2m

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Maingate

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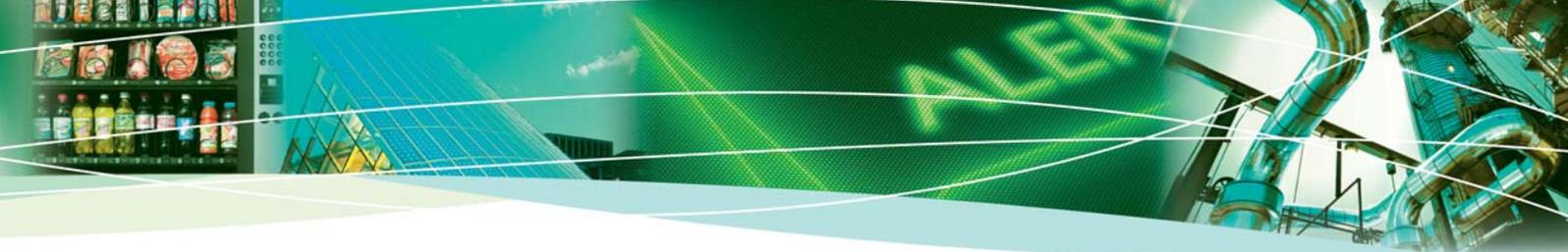
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SIGFOX describes itself as the first and only cellular network operator dedicated to low bandwidth communications for connected objects. Thanks to its patented UNB technology, SIGFOX says it is revolutionising the world of machine-to-machine communications (M2M) and the Internet of Things (IoT), by enabling large-scale connection of objects through a simple, low-energy consuming and cost-effective, subscription-based connectivity solution.

SIGFOX contributes to wireless communication networks what Twitter contributes to Web communications, that is to say, the ability to communicate the essentials at low cost. For more information, visit www.sigfox.com and follow them on Twitter @sigfox.

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SingTel is a strategic investor in the region's most successful mobile operations. In addition to its wholly-owned subsidiary, Optus in Australia, the group has a 23% stake in Thailand's Advanced Info Service (AIS). It has a 32% effective interest in Airtel, India's largest GSM operator, which has significant presence in Bangladesh, Sri Lanka and Africa.

SingTel also has a 47% stake in Globe Telecom in the Philippines and a 35% stake in Indonesia's largest mobile operator, Telkomsel. It has a 45% stake in Pacific Bangladesh Telecom Limited (PBTL). The SingTel Group's footprint now covers a population of more than 2 billion across Asia Pacific and Africa and serves 477 million mobile customers in 25 countries. More information can be found at www.singtel.com and www.optus.com.au

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Stream – with offices in Canary Wharf, London and Glasgow – is said to be Europe's most innovative M2M IP-based GSM and Satellite specialist service provider. The company has provided enhanced mobile network resilience, connectivity and SIM/network management to the machine-to-machine (M2M) sector since 2000.

Stream has consistently innovated services specific to the M2M sector for the past decade. The company manages and provides multiple mobile network services (GPRS, CDMA, 3G 4G and Satellite) in the UK and overseas to the M2M sector. Oasys is Stream's network enablement, management and billing platform. This combines with high-resilience, off-mast network infrastructure and architecture. More information is available at: www.stream-communications.com

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Taoglas is reported to be the world's leading antenna solutions provider to the machine-to-machine (M2M) and Internet of Things (IoT) market. It provides a comprehensive range of external, embedded and base station antennas for connected devices and technologies.

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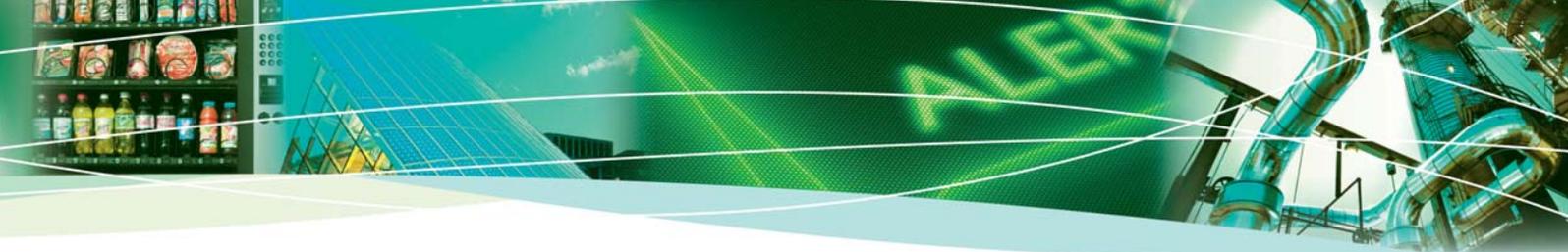
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Telenor Connexion designs and operates connected business solutions. Building on more than 15 years of experience, a strong solutions portfolio and our collaborative approach, the company aims to make it easy to realise

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VanillaPlus Magazine is the only analyst-led global communications magazine. It is dedicated to 4G communications, Bill & Charge, Big Data Analytics, CEM & Customer Care, Policy Management, and Revenue & Fraud. Now in its 15th year of publication, it provides unrivalled, impartial information on systems for profitable communications, digital media and entertainment. It is available on paid subscription (details at www.vanillaplus.com). The print and digital magazine is circulated six times per year to 5,110 named communications directors and senior managers.

www.VanillaPlus.com gives access to a range of information for fixed, mobile and convergent network operators plus internet, communications and digital entertainment service providers worldwide. VanillaPlus analyses the latest communications news from around the world, is available free of charge as a digital magazine, offers free article Downloads, a global Event Diary, and the annual VanillaPlus Directory. The VanillaPlus Directory is the only one of its kind and contains A-Z Listings of 500+ independent software vendors, system integrators, original equipment manufacturers, and consultants in the Business and Operations Support Services (BSS /OSS) space.

Wyless

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Wyless is the leading global M2M managed services provider. Our resilient platform, delivered in partnership with the world's largest network operators, provides secure, reliable communications with wireless devices in over 120 countries. Powerful management tools offer real-time reporting and control over all devices connected to our network. Wyless delivers a comprehensive suite of managed services with unrivalled expertise, professional support and competitive pricing. We enable our customers and partners to deploy M2M applications and services faster, cheaper and more effectively. The world's most advanced M2M Platform from the world's most trusted M2M partner. It's good to be well connected"

COMPANY NAME	URL	COMPANY NAME	URL	COMPANY NAME	URL
Telstra	www.telstra.com.au	Trivnet	www.trivnet.com	Vlingo	www.vlingo.com
Telular Corp	www.telular.com	Tuff	www.tuff.co.uk	Vodafone M2M	www.vodafone.com
TELUS Mobility	www.telusmobility.com	twingz development	www.twingz.com	Vodat International	www.vodat-int.com
Tenable Network Security	www.tenable.com	Twisthink LLC	www.twisthink.com	Voice Objects	www.voiceobjects.com
Tendril	www.tendrilinc.com	u-blox	www.u-blox.com	Volvo	www.volvo.com
Teneo	www.teneo.net	Ukash	www.ukash.com	VW Group	www.volkswagen.co.uk
Teradata	www.teradata.com	Ulticom	www.ulticom.com	wave2m	www.wavelink.com
Tevron	www.tevron.com	USAT Corp.	www.usatcorp.com	Wavenis OSA	www.wavensis-osa.org
Texas Instruments	www.ti.com	Utiba	www.utiba.com	WebTech Wireless Inc	www.webtechwireless.com
Thales	www.thalesgroup.com	Utilimetrics	www.utilimetrics.org	WeDo Technologies	www.wedotechnologies.com
The Brattle Group	www.brattle.com	V2COM	www.v2com.mobi	Western Union	www.westernunion.co.uk
The Morey Corp	www.themoreygroup.com	Valimo	www.valimo.com	Widetag	www.widetag.com
Theta Networks	www.thetanetworks.com	Value Team	www.valueteam.com	Wipro	www.wipro.com
Thinglink	www.thinglink.com	VanillaPlus	www.vanillaplus.com	Wireless Innovation Ltd	www.wireless-innovation.co.uk
ThingWorx	www.thingworx.com	VC4	www.vc4.nl	Wireless Logic	www.wirelesslogic.com
TIBCO Software, Inc.	www.tibco.com	Vendavo	www.vendavo.com	Withings	www.withings.com
Tieto	www.tieto.com	Ventraq	www.ventraq.com	Wyless Inc.	www.wyless.com
TimeData Corp	www.timedatacorp.com	Verax Systems	www.veraxsystems.com	Xact Technology LLC	www.xacttechnology.com
TMNG	www.tmng.com	Verecloud	www.verecloud.com	Xavient	www.xavient.com
TNO	www.tno.nl	VeriFone	www.verifone.com	Xelas Software	www.xelas.com
Toll collect	www.toll-collect.de	Verint	www.verint.com	Xintec	www.xintec.com
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Traak Systems	www.traak.com	Verizon Wireless	www.verizonwireless.com	Xively	www.xively.com
Transatel	www.transatel-m2m.com	Vertek	www.vertek.com	Xwave	www.xwave.com
Transparency Market Research	www.transparencymarketresearch.com	VI-Agents, LLC	www.viagents.com	Yellow Pepper	www.yellowpepper.com
Transverse	www.gotransverse.com	Via Expo Ltd.	www.viaexpo.com	ZTE Corp	www.zte.com.cn
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Trilliant	www.trilliantinc.com	Visionael	www.visionael.com		
Trimble	www.trimble.com	Visiongain	www.visiongain.com		
Triptec Ltd	www.triptec.de	Vitria	www.vitria.com		

EXPERT OPINION:

Unlocking the total value of M2M

Do you ever wonder why people and organisations invest in machine-to-machine communications (M2M) and the Internet of Things (IoT), asks Fred Yentz? Reasons may differ somewhat across industry segments but in most cases they fall in one or more of three categories: To make money, to save money or to be compliant. ILS Technology is squarely focused on helping companies achieve these goals, unlocking the real value of M2M.

The author is Fred Yentz, president and CEO of ILS Technology, a Telit company

ILS Technology is a pioneer in the development and deployment of products and services for seamless and secure connectivity and integration between machines and enterprise IT systems. You can imagine why we are very excited about being the newest addition to the ever-growing global **Telit** family, as we bring valuable services to the ONE STOP. ONE SHOP. experience offering unique synergies and integration of modules with connectivity and application services.

Industry-leading M2M application enablement platform

ILS Technology was among the visionaries to recognise early on that emerging wireless technologies could do more than simply connect people, but also machines to other machines. We started using LAN and WAN, then quickly cellular and satellite to seamlessly integrate remote machines with enterprise systems and databases – unlocking a new wave of real-time, actionable business intelligence and operational efficiencies. Our deviceWISE m2m Application Enablement Platform (AEP) was the industry's first complete end-to-end M2M platform to provide seamless connectivity and integration across any remote device, any network and any enterprise application in the back office – enabling intelligence in no time.

The secure and scalable platform lets you configure and deploy enterprise-grade remote monitoring and control applications without any programming. For example, using do-it-yourself tools, you can easily determine what devices and functions to monitor and control; when and how frequently to collect information; how often to report data and

to whom; what enterprise applications to integrate and what behaviours to ignore or flag and under what conditions to take action, to name a few. The fundamental components of the deviceWISE m2m AEP suite are:

• **Asset Gateway** – a powerful agent that turns any gateway or router into a full edge micro analytics engine enabling rapid development of custom applications depending on the customer's needs;

• **Enterprise Gateway** – an enterprise-grade software package that enables rapid integration of data from the deviceWISE m2m Service to the enterprise application that is installed in the customer's own data centers;

• **Workbench** - a powerful application designed with drag-and-drop simplicity to provide speed and flexibility in building gateway and enterprise transaction logic, enabling end-to-end application design with minimal time and effort.

The deviceWISE m2m Platform reduces risk, time-to-market, complexity and cost of deploying solutions for remote monitoring and control, industrial automation, asset tracking and field service operations across virtually all industries and market segments around the world.

deviceWISE is offered in three models:

• **Cloud-based M2M Platform-as-a-Service (PaaS)**
Popular with companies and enterprise customers

– large and small – as well as application service providers and system integrators for enabling quick and simple connectivity and integration between their remote devices and back office applications – this usage-based service lets you "pay as you grow".

- **Mobile network operator M2M application enablement platform**

Licensed by carriers and large IT outsourcing and systems integration (SI) companies preferring a turnkey secure and scalable technology platform. ILS Technology provides upfront customisation, integration services, lifecycle technical maintenance and support – letting forward-thinking operators focus on marketing and operating innovative revenue-generating M2M services under their own brand.

- **Enterprise LAN software**

Installed and maintained on-site for leading industrial automation companies which depend on mission-critical connectivity and operational efficiencies. Developed to operate within the "four walls" of the enterprise, the software connects and integrates production machines and processes with existing enterprise resource planning (ERP) and manufacturing resource planning (MRP) systems.

Open ecosystem

Our M2M platform is designed to work with the majority of devices and software in the market, including Telit modules and m2mAir services. ILS Technology collaborates closely with an ever-expanding network of recognised M2M experts and innovators around the world. Our business partners include leading technology and product developers, system integrators and telecom carriers – offering customers hardware and software, integration services and support, wireless network services, custom point solutions and applications, or turnkey commercial deployments, as needed.

Our device and software partners are encouraged to join the deviceWISE Ready program – a comprehensive certification process that ensures interoperability and simple integration.

ILS Technology: A 13-year old company with 30 years of M2M experience

ILS Technology was established around the successful and proven production automation software it had obtained as a spin-off from **IBM**'s e-Production Solutions line of business in 2000. Having been key contributors to the original

software development at IBM, our founders further evolved the production automation software into a market-leading device driver portfolio, scalable server and embedded software offering for the global factory automation market.

The company went on to develop eCentre, the forerunner of the secureWISE suite of products and services. Recognised for enabling secure and controlled remote connectivity and collaboration, secureWISE today continues to be the *de facto* trusted third party service platform for the semiconductor, solar and cleantech industries.

Leveraging our strong market position in device management, secure remote connectivity and collaboration, ILS Technology created the deviceWISE Platform to provide intelligent and secure connectivity for industrial automation "within the four walls" of manufacturing facilities around the world. deviceWISE seamlessly connects and integrates production equipment on a factory floor with the enterprise resource planning systems and back office.

The vendor-neutral solution can be easily integrated with industry-standard production equipment, making deviceWISE the industrial automation platform of choice. The accomplished deviceWISE platform was then naturally extended over cellular and satellite, immediately becoming recognised as the industry's leading secure m2m Application Enablement Platform and today a key and integral part of Telit's ONE STOP. ONE SHOP. offering. ◐

'M2M is a 3-letter word for a Mess' – M2M Innovation Congress in Nice provokes strong debate

The organisers of the recent M2M Innovation World Congress held in Nice, France declared "Mission Accomplished" for the first such event. Over three days, from September 24-26, 260 delegates from around the world learned from and met with 65 eminent speakers to foster innovation in M2M services. Some strong views emerged at the conference and you can view the video at www.M2MNow.biz (search 'Nice').

According to a spokesperson for the organisers, **Strategies TM**, "These M2M stakeholders and implementers from a variety of industry verticals shared experiences, made new contacts, strengthened existing relationships and honed their knowledge from concrete implementations in smart grids, smart cities, retail and smart homes fields. The fruitful exchanges have been extended to the exhibition held alongside the conference as well as to the participants of the three other co-located events." ➔

This was all part of the World Smart Week event, which gathered together a total of 1,375 ICT professionals on the French Riviera.

'A three-letter word for a mess'

Steve Priestley, EMEA managing director of **Wyless**, told the audience, "M2M is a three-letter word for a mess". In his paper to the conference he had already reminded everyone that "there is no on-size-fits-all solution" for M2M.

Asked by the moderator, Jeremy Cowan, editor of **M2M Now**, what were the most common problems or challenges that customers bring to him, Priestley said: "We have solutions that fit multiple stratas of technology, whether they're business-to-business or business-to-business-to-consumer. For example, we have 20-30 different solution sets, all termed eHealth. There are a bunch of technologies that come together to solve some of these problems.

"Unfortunately what happens is, you then have to fit a financial model. What our industry has got to do is lead people through how we create solutions in a far more professional and beneficial way, such that we're solving the needs. The industry as a whole has got to take charge of that and build products that make problems go away in an easy fashion," said Priestley.

As recalled by **Deutsche Telekom**'s head of International Sales Development, Sven Krey at the plenary opening session, "Driving M2M Innovation is vital for the M2M ecosystem". Indeed, this was precisely the slogan of the conference. Like Deutsche Telekom, other opening keynotes insisted on innovative and flexible business models to create end-to-end solutions and value.

'Big Data doesn't scale'

Also key to achieving the full potential for M2M services, Dr. Gareth Noyes, chief strategy officer at **Wind River**, maintained that Big Data doesn't scale: a data-centric design is required, bringing intelligence where needed in the Internet of Things (IoT) architecture.

Partnerships and collaborations were two other keywords, and they were widely and forcefully debated during the panel "So you want to get M2M

services to market quickly and profitably" chaired by M2M Now's editorial director, Jeremy Cowan (*pictured above*). **Maingate**'s CEO, Baard Eilertsen set the tone, launching his remarks with a provocative statement, "M2M is dead" to highlight that the M2M industry as still too technology-driven. The exchanges that followed and the rest of the conference's multiple sessions showed that M2M innovation is about a lot more than just technology.

On Wednesday and Thursday morning, 10 thematic sessions in two parallel tracks tackled both sides of innovation: The 'M2M for Verticals' track focused on the most innovative M2M implementations, the lessons learned and advanced solutions in Smart Grids, Retail and Smart Home/Smart Devices.

The 'Strategies & Implementation' track covered tomorrow's ecosystems and solutions that will drive M2M growth: innovative ways to better integrate ecosystems; focus on Big Data; platform interoperability issues; as well as connectivity challenges and security.

Multiple live experiences

In addition to the conference content, the Congress offered multiple live experiences, in particular a private demonstration of 'Nice Grid', a pioneer solar-energy smart grid that is claimed to be unique in the world when judged by its scale and ambition.

The exhibition running alongside the conference provided additional opportunities for delegates to get their hands on the latest solutions and products. On this occasion, **ThingWorx** and **SIGFOX** announced their partnership. The partners demonstrated an end-to-end smart meter and intrusion-detection application on stage, running on the SIGFOX network and the ThingWorx application platform.

Cellnetrix also showcased several live demonstrations of different configurations of M2M device identity modules for example.

The M2M Innovation World Congress experience was completed with several social events, in particular the Gala Evening held at the stylish Palais de la Méditerranée on Nice's Promenade des Anglais.

M2M Now's editorial director, Jeremy Cowan chaired the session, "So you want to get M2M services to market quickly and profitably"

Other key sessions were filmed and videos will be available online from early December through the World Smart Week.TV webcast platform. And you can see event photos on the Congress's Home Page at **www.m2minnovationworldcongress.com**

See the video online at: **http://youtu.be/CzNoV53YnQE**
See slide presentations online at: **www.m2minnovationworldcongress.com/proceedings**

European Utility Week
15-17 October 2013 • Amsterdam • The Netherlands
www.european-utility-week.com

European Utility Week 2013, Amsterdam:
Visitor demand, event response

Operating under its new name, European Utility Week is said to have attracted 8,000 smart energy professionals to the vibrant conference and exhibition in Amsterdam. For three days executives were assailed with new information on smart grids, smart homes, smart metering, and renewable energy integration and storage. Here are some impressions from the editor, Jeremy Cowan of what was on offer.

Nandini Basuthakur, Opower: We need smart meter education

Residential demand response research

EnergyVille and its partners presented the results of its Linear research project in Amsterdam. The Linear Project works with 250 test families in Flanders, Belgium to investigate the technical and economic feasibility of residential demand response to assist the transition to renewable energy. Linear is reportedly one of the largest smart grid research projects in Europe, combining smart appliances, smart meters and home energy management systems with the electricity grid.

In the future electricity prices for consumers may vary during the day, depending on the offer (wind and solar energy) and the demand (night, weekend, evening peak, cold weather). Families will be able to decide if they only want to turn on their washing machine in a 'smart' way, when electricity is cheap or, even better, the appliance can be turned on automatically when electricity is cheap.

It will also be possible to let the electricity grid decide to turn on the machine within a 'comfort zone' that is pre-arranged by the family. That way the grid can use electricity surpluses on a regional and countrywide level until the peak is 'used up', says **Kamstrup**. Project leader, Wim Cardinaels adds: "Smart grids, the combination of smart meters, smart appliances and energy management systems, can offer an affordable solution to keep our grids reliable in the future and adapt them to renewable energy."

Drive cost-effective DR at scale

Managing peak electricity usage is crucial for utilities to keep the grid running and keep costs under control. However, engaging customers in programmes that shave peak demand has never been an easy task, after all only 5% of US homes currently participate in any kind of demand response (DR) programme.

To tackle this **Opower** has launched its Behavioural Demand Response (BDR) platform – a solution designed to enable utilities to mobilise cost-effective demand response across their entire residential customer base. BDR leverages smart meter data analytics and behavioural science to deliver personalised insights that motivate millions of customers to slash their peak-time power usage. The BDR platform integrates multi-channel communications such as web, text, phone and print.

Utilities can adopt BDR as a standalone solution, or use it to bolster existing direct load control programmes. In addition, the personalised alerts and feedback that drive the BDR platform are can support utilities as they move to time-of-use pricing.

Talking to **M2M Now** at the show, Nandini Basuthankur said, "Our strategic focus has been on working with utilities to engage with customers. Energy efficiency isn't a euphemism for less revenue. When customers interact more they buy and refer to friends. So we're working with 95 utilities worldwide.

"The average human," she continued, "spends 7-9 minutes per year thinking about energy consumption versus 96 hours a year on Facebook. Even them they say, 'What's a kilowatt or standing charge?' They engage (with the utility) only if the power is out or the bill's too high."

Energy efficiency is hugely important, Basuthakur says. "We need smart meter education – showing that it won't spy on me or give me cancer. At the moment in the UK for example, all the utilities are seen as the same, so differentiation is crucial."

Two smart metering pilots in Turkey

Differentiation is clearly being embraced in some countries. Skanderborg, Denmark-based Kamstrup together with a business partner **VIKO**, has signed contracts on two smart metering pilots in Turkey. The contracts are with **Türk Telekom Group**, and the regional electricity distributor, **EnerjiSA group**. The two projects are among the first such pilots in Turkey and are expected to lead to a Turkish smart grid.

Türk Telekom Group, a leading telecommunication and fibre network operator, sees big potential in providing smart metering services to energy distributors. So it has teamed with the Danes to test OMNIA, Kamstrup's full smart grid platform comprising network communication, data management and smart meters.

The pilot is being carried out in the Bursa region, a geographically challenging area where the electricity is supplied by **UEDAS**, owned by **KOLIN-LIMAK-CENGIZ** group. "That is why we have chosen a wireless Radio Mesh system," says the research and development manager from Türk Telekom. "With a Radio Mesh system we are not bound to the sub- ➜

stations, we can install the concentrators where it suits us best, for example in the fibre distribution boxes. It's a big advantage that the wireless system can work independently of the powerlines, because PLC solutions have some obvious difficulties in this mountainous area." Bursa has the potential for 750,000 metering points and the distribution group has up to 9 million metering points in total.

A second smart metering pilot is running in the Ankara area in co-operation with **BaşkentEDAS**, owned by **EnerjiSA**, a joint venture of **Sabancı** and **E.ON**, again with potential for 9 million metering points. Four typical residential areas have been carefully chosen to test the system performance under different conditions. A spokesman for Başkent says, "A variety of alternatives have to be evaluated in order to reach a realistic smart-metering system. Kamstrup's RF metering solutions could be a promising solution for us."

Next-generation smart meter M2M system

Bringing a scalable, secure solution to utilities, meter manufacturers, and mobile network operators, global smart energy communications provider **Trilliant** introduced Smart Meter M2M System. This aims to give utilities the flexibility to choose meters and mobile network operators while ensuring a secure and scalable smart meter solution.

With the recent decision by the UK Government to use mobile networks as a key component of the British smart meter rollout, the viability of mobile networks to connect a smart meter system has been validated, says Trilliant. Utilities around the world will be watching this ambitious programme.

The Trilliant Smart Meter M2M System, which has been successfully deployed for smart metering in the UK, helps utilities and mobile network operators (MNOs) to deploy smart meter and smart grid communications projects knowing that the systems are secure, scalable, and flexible. Purpose-built for smart metering and able to link to existing MNO M2M management platforms, the Trilliant Smart Metering M2M System offers utilities fully integrated connectivity, from smart meter commissioning to downloading of energy tariffs and requests for meter data.

This new Smart Meter M2M System extends the Trilliant Platform, combining a global 2.4GHz RF mesh, M2M cellular, broadband mesh, and other standards-based technologies to give utilities the flexibility to choose the right technology and roll-out strategy for their territory and regulatory environment, while meeting cost and performance targets. The Trilliant platform is now used by more than 200 utilities worldwide. ★

Put November 4-6, 2014 in your calendar now and we hope to see you in Amsterdam.

More than keeping the lights on

Tobin Richardson: Easy to install and maintain ZigBee because it's low power

OK, here's the official spiel. **The ZigBee Alliance** is a global ecosystem of companies creating standardised wireless solutions for use in commercial and consumer applications, including energy management. ZigBee operates in the 802.15.4 arena, and offers green and global wireless standards connecting the widest range of devices to work together intelligently. The alliance is an open, non-profit association of approximately 400 members driving development of innovative, reliable and easy-to-use ZigBee standards.

But we wanted to hear more in plain English from the alliance's chairman and CEO, Tobin Richardson. During a flying visit to his stand at EUW 2013, he told **M2M Now**: "ZigBee was created for low power, low data, wireless networks. It has typically had a strong message for utilities. Now ZigBee is extending so that it is not just sending data but exercising controls. Our applications for utilities are demand response and load control.

"You can give a third party control so that, for example, if the price of electricity goes over, say, 30 cents per kilowatt-hour I can

control when the dishwasher is operating. In San Diego Convention Centre all light bulbs are controlled by ZigBee. It stops the hub being overloaded by having control at the nodes. In fact, it's good for security, access and lighting control. There are no new wires involved," adds Richardson, "it's easy to install and maintain because it's low power. It's a mesh, so it's a self-healing and organising network, and it's scalable to thousands of devices. A WiFi or Bluetooth grid is good at sending content; ZigBee is good at providing greater intelligence between devices by means of application profiles."

In April, ZigBee announced the completion of the Smart Energy Profile 2 (SEP 2) standard. SEP 2 provides IP-based information and control for energy management in Home Area Networks (HANs), for both wired and wireless networks. SEP 2 supports new capabilities such as control of plug-in and hybrid electric vehicle (PHEV) charging, deployments in multi-dwelling units such as apartment buildings, support for multiple energy service interfaces into a single premises and support for any transport based on IETF IP compliant protocols such as the recently announced ZigBee IP.

SEP 2 is being supported by manufacturers of smart meters, appliances, programmable thermostats and other devices in homes, utilities, energy service providers as well as government and standards organisations worldwide.

What's On

M2M Now 'Money Talks – mHealth'

December 10, 2013, Washington DC, USA
http://m2mnowevents.com/

M2M Now 'Money Talks – mHealth' is the first of a series of events focusing on vertical market sectors that are challenged by the emergence of innovative machine-to-machine (M2M) communications.

Healthcare expenditure is high as a percentage of GDP in most countries, and the costs are rising sharply towards unaffordable levels. So, there is an urgent need for new, sustainable business models that can help to curb expenditure at the same time as promoting more targeted healthcare service delivery.

The focus among healthcare professionals and planners is shifting from traditional to newer delivery models and mHealth has a significant part to play in this change. It's time to explore the business and care provision models that work and change those that don't.

This event looks at the role of mHealth in this transition. It will focus on key healthcare segments and the challenges that need to be addressed for successful healthcare in the 21st Century.

Wavefront M2M Summit 2014 – Driving business transformation
February 4-6, 2014, Vancouver, BC, Canada
www.wavefrontsummits.com

Forum Industry in Transition: The Information Driven Enterprise USA 2014
February 10-13, 2014, Orlando, Florida, USA
www.arcweb.com/events/arc-industry-forum-orlando/pages/default.aspx

Mobile World Congress
February 24-27, 2014, Barcelona, Spain
www.mobileworldcongress.com

Embedded World – Exhibition & Conference
February 25-27, 2014, Nürnberg, Germany
www.embedded-world.de/en/

European Smart Grid Cyber and SCADA Security
March 10-11, 2014, London, UK
www.smi-online.co.uk/2014cybergrids25.asp

In a true crowdsourcing effort, Fukushima citizens measured radiation levels in real-time, mapping their efforts on the internet to provide greater public insight into radiation levels where they lived, worked, and travelled

Wireless sensor networks enable crowdsourced measurement of radiation levels in Fukushima

After the Fukushima earthquake and tsunami, and the meltdown of three nuclear reactors, Japan faced an enormous public health crisis. One M2M company quickly addressed the need to monitor radiation levels by designing a sensor device that could be used directly by the Japanese people themselves without the need to rely on measurements taken by local authorities. Report by Libelium's David Gascón.

The March 11, 2011 earthquake and accompanying tsunami that struck the north coast of Japan devastated the region. Registering 9.0 on the Richter scale, the earthquake was the fifth-strongest ever recorded and — with the tsunami — turned hundreds of thousands of buildings into rubble. The resulting death toll was enormous: nearly 16,000 people were killed and more than 3,000 are still missing two years later. The global consequences of the disaster were soon magnified by the Level 7 meltdown of three reactors at the Fukushima Daitchi Nuclear Power Plant, which forced the evacuation of more than 100,000 area citizens.

The situation at Fukushima drew worldwide attention and concern that another Chernobyl could be developing. Not only public health and safety experts, but scientists, aid workers, and others from countries far and wide sought to offer their services in response. That was certainly the case in Spain, in Zaragoza. Responding to a critical need for the people of northern Japan to monitor nearby radiation levels, we at Libelium soon developed radiation sensor boards — with each node acting as a Geiger counter — that

could be used by the general Japanese community to monitor radiation levels in their neighbourhoods in real-time, so they wouldn't need to rely on authorities' intermittent reports. At the time, radiation meters were difficult to find on the market — and affordable ones for the general public, impossible.

Using the Arduino open source microcontroller as a base, we developed radiation sensor boards that could incorporate Geiger tubes and display radiation level readings on an LCD screen. Since the Geiger tubes came without documentation from various manufacturers (primarily from Russia and China, who sold them for military purposes), Libelium reverse-engineered and tinkered with these radiation tubes to come up with a prototype board in a couple of weeks. We then made the radiation boards' source code available under general public licence (GPL).
Via the Tokyo Hackerspace
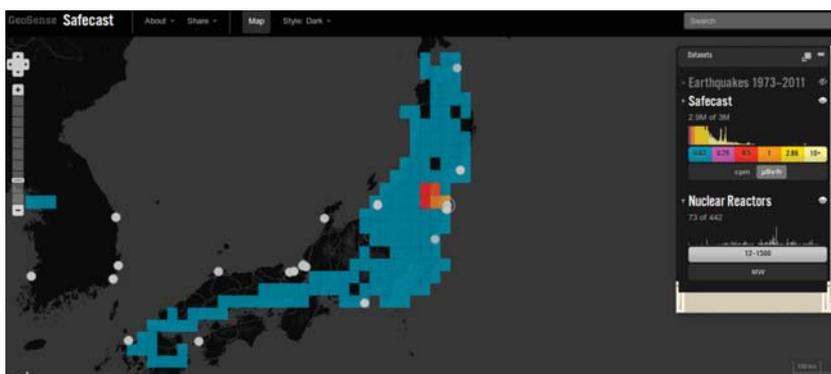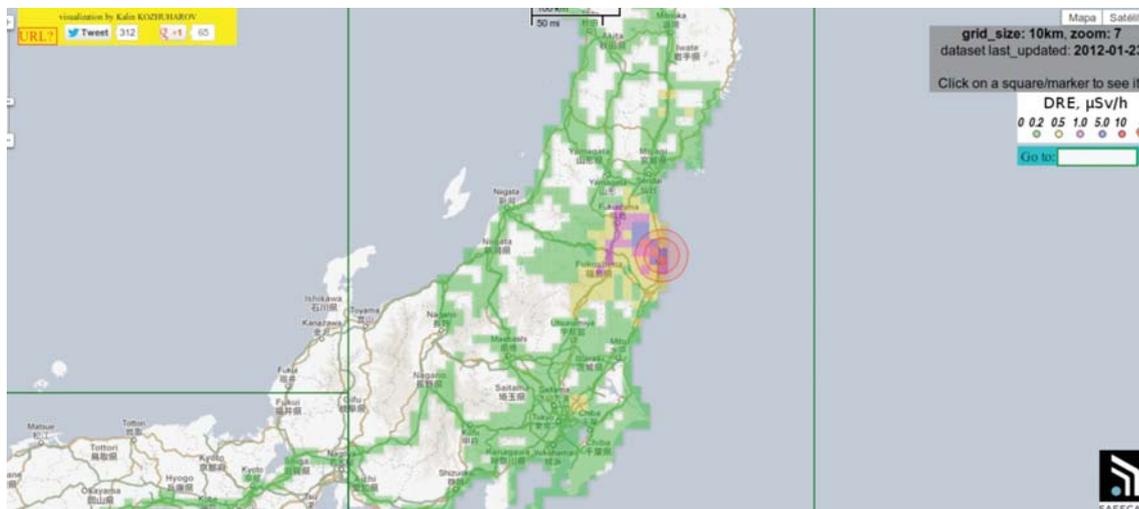
Fig. 1. The Libelium Radiation Sensor Board for Arduino
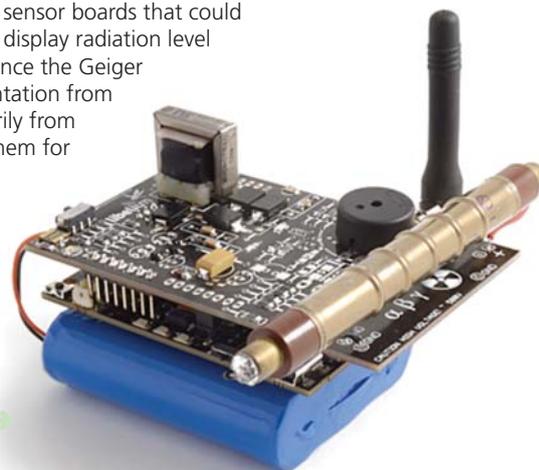
Fig. 2. Safecast maps measuring radiation within Japan

David Gascón is co-founder and CTO of Libelium.

and other outlets, these boards were provided from Cooking Hacks — the open hardware division of Libelium — free of charge to Japanese citizens so they could constantly monitor radiation levels at any time and at any place: in their towns, in their gardens, on their farms, at their markets, etc. Instructions for using the Geiger counter boards were posted to the Cooking Hacks blog so that calculations could be done using conversion factors that took into account the type of tube used. There, users also found information related to differing radiation levels, including ones that posed potentially dangerous threats.

A crowdsourcing response to the disaster had begun. Instrumental in this effort was Safecast, an organisation founded days after the Fukushima disaster by private citizens in Japan and the U.S. Typically, radiation levels reported to the public — even in the aftermath of major nuclear accidents — are at the mercy of government agencies, and reports can be slow in forthcoming and sometimes questionable. Since the Fukushima meltdown, however, Safecast has provided radiation meters that have now captured more than 10 million data points. While the boards

Email:
d.gascon@libelium.com

distributed by Libelium/Cooking Hacks monitored radiation levels wherever the citizen users lived, Safecast focused more directly on urban centres, city roadways, and areas of highly concentrated populations. Volunteer monitors have posted their findings as data points on a Google map, accessible to anyone using the internet.

This was a novel concept at the time in terms of a public health response. Prior to the Fukushima disaster, citizens generally relied entirely on information controlled by their governments on the relative safety or danger they face in such crises. Such dependence had catastrophic consequences after Chernobyl. Yet crowdfunding and crowdsourcing helped ramp up the response to the Fukushima disaster in all sorts of ways: delivering emergency food, water, and medical supplies, temporary shelters, and a host of other needs. And its value in determining radiation levels after the accident was accurately measured by the people involved.

Similar technological responses to public health crises are something Libelium seeks to address in other regions where widespread health concerns are an ongoing fact of life. Through Cooking Hacks, the company has developed an e-Health sensor platform and sensor shield that enables Arduino and Raspberry Pi users to monitor patients for pulse, airflow, ECG, blood oxygen, temperature, sweating, blood pressure, and position.

While such devices can cost upwards of US$45,000, our platform allows sensor shields to be produced for around $450, or just one percent of the professional market cost. In much the same way radiation monitors benefited those of northern Japan, our efforts in conjunction with the broader development community can help provide the necessary tools and devices needed in impoverished regions of developing countries that face constant health care crises.

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HEADS

The M2M Doctor is
now in the House,
says Wyless
CEO MacDuffie

mHEALTH
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Exclusive Preview of
the vital mHealth Event
in Washington on
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More Information? Please email info@ihassociation.org, or call 484.995.8383. Visit ihassociation.org, intelligenthospital.tv, intelligenthospital.org and intelligenthospitaltoday.com

The Intelligent Hospital™ Pavilion concept is creating new ways for healthcare executives to witness technology integrating with patient care delivery.

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WELCOME TO M2M now MONEY TALKS mHealth

It's our pleasure to welcome you to the inaugural M2M Now Money Talks event (m2mnowevents.com), a live exploration and discussion of the opportunities and challenges that face everyone involved in delivering effective mobile healthcare (mHealth) services using machine-to-machine (M2M) communications.

M2M Now 'Money Talks – mHealth' is the first of a series of events focusing on vertical market sectors impacted by the emergence of innovative machine-to-machine (M2M) communications. Worldwide, healthcare expenditure is a high percentage of GDP and it continues to rise sharply towards unaffordable levels. There is an urgent need for new, sustainable business models that can help to curb expenditure while promoting more targeted healthcare service delivery.

So the focus is shifting from traditional to newer business models such as mobile healthcare (mHealth). This event focuses on this transition, looking at key healthcare segments and some of the challenges that need to be addressed for implementation to be successful.

Turn to page S8 in this dedicated mHealth Supplement to find details of the Demo Zone, an area devoted to showing you the 'best-of-breed' M2M-based mobile health solutions. On pages S8 – S9 you can see the list of Speakers and the Conference Agenda.

Meanwhile, the team at M2M Now would like to extend our thanks and appreciation to all of those who have made this event possible, not only our Event Supporters – Beecham Research, Continua Health Alliance, Healthcare Information and Management Systems Society (HIMSS), Intelligent Health™, and RFID in Healthcare Corporation – but also our Sponsors who are listed below.

ALSO IN THIS SUPPLEMENT

Wyless
Wyless is a leading global M2M managed services provider. Its resilient platform, delivered in partnership with the world's largest network operators, provides secure, reliable communications with wireless devices in over 120 countries. Powerful management tools offer real-time reporting and control over all devices connected to our network. Wyless delivers a comprehensive suite of managed services.

Telit
Telit Wireless Solutions enables machine-to-machine communications worldwide providing wireless module technology, M2M managed services and value added services, including connectivity. The company constantly works for technology leadership through six research & development centres across the globe. Telit offers an extensive portfolio of high quality cellular, short-range RF, and GNSS modules, available in over 80 countries.

Gemalto
An M2M industry pioneer and market leader for more than 15 years, Gemalto M2M helps its customers to excel in a complex M2M ecosystem through the foundations of expertise, security, simplicity and partnership. Gemalto M2M's award-winning products and services allow machines, equipment, vehicles and other assets to securely communicate over wireless networks, helping enterprises simplify operations, increase efficiency and establish new business models.

Vodafone
Vodafone Machine-to-Machine (M2M) connects 'things' to the internet, transforming them into intelligent devices that exchange real-time information and open up a range of possibilities for how businesses are run, how they grow and how they keep customers happy.

Oracle
Healthcare providers and payers are confronting the hard reality that the current pace of cost escalation is not sustainable. In response to this challenge, Oracle delivers powerful solutions that address critical areas in the healthcare industry.

The M2M Doctor is in the House

Mobile health is M2M at its most rewarding. So says, Dan MacDuffie CEO of Wyless (left). And he should know, his managed services company has achieved 50% year-on-year growth recently and a growing portion of that is in mHealth and Wellness services. He's certain we're standing on the threshold of a new generation of health services that cut delivery costs, extend the reach of care givers, and bring new levels of care to patients. What is more, this growth is no longer confined to North America.

M2M Now: Dan, have we arrived at an mHealth tipping point?

Dan McDuffie: Yes, we have arrived. There is broad acceptance that mHealth reduces the overall cost of care and in the US business is accelerating. Sam Lucero of research house **IHS** indicates that revenues from connected healthcare services will have a CAGR of over 80% during the next few years.

In addition, there have been some large acquisitions, for example, **Medtronics** paid US$200m for **Cardiocom**. We're also starting to see innovative solutions like **VGo** ➜

Industry estimates predict that by 2015 there will be 500 million smartphone users worldwide using healthcare applications.
US Food and Drug Administration agency (FDA)

that take telemedicine to a brand-new level. Go to www.vgocom.com and you'll see what I mean. Starting next year we will be powering this innovative new product on our 4G LTE Managed Network.

Advances in cellular technology, cost reductions in electronics and the growing need for remote management of patients have brought together a catalyst for long awaited innovations in mHealth. Over the next three to five years, remote homecare, self-diagnosing kiosks in pharmacies, and both personal and prescribed healthcare apps will become the norm.

We're a mobile society and mHealth is an integral component. There are numerous healthcare devices that monitor different conditions. In the past they were tethered to a landline connection: now the connections are wireless and that was the core competence that **Wyless** brought to this exciting M2M sector. In the last 12 months our mHealth revenues have more than doubled, which is another indication that the tipping point has been reached. It would probably be more accurate to say that we've passed that point.

M2M Now: Are smartphones and tablets set to play a key role?

DM: Yes, they are, in fact they're already playing it. It's a BYOD role that divides into fitness apps and preventative healthcare apps, but of course they're related. If you download a fitness app that monitors your activity and another that measures your calorie intake then you are less likely to be overweight and develop diabetes or get a heart attack.

The FDA, the US Food and Drug Administration agency, says industry estimates predict that by 2015 there will be 500 million smartphone users worldwide using healthcare applications. And by 2018, half the predicated 3.4 billion smartphone and tablet users will have downloaded at least one medical or health app.

It's hard to overestimate the importance of this development. It encourages people to become engaged in their fitness and self-diagnosis, and helps minimise denial, which is potentially ➡
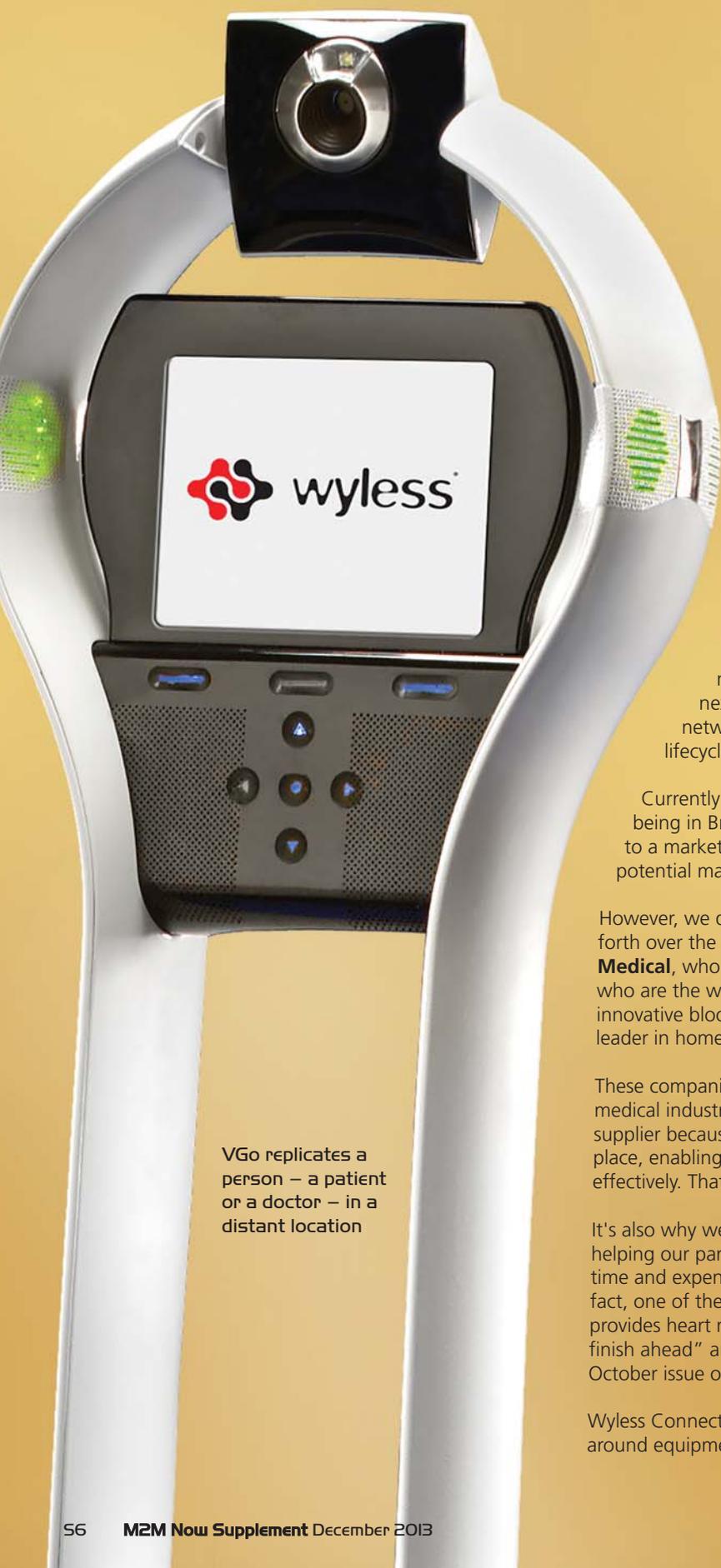
VGo replicates a person — a patient or a doctor — in a distant location

dangerous. There is a hypochondria angle, but I don't think it's significant. And self-diagnosis is timely, unlike an annual check-up, which is something that many people cannot afford. In a nutshell, BYOD technology is creating a very positive, holistic awareness of the importance of healthcare.

M2M Now: Can you summarise your company's role? What added value does Wyless bring to the table?

DM: As I said earlier, our core competence is wireless, the clue is in the name of the company. Wyless is the leading provider of global M2M wireless connectivity solutions and managed services. As a service provider, we operate a global, secure managed network that layers 'over the top' of our MNO partners. It provides end-to-end managed services to enable our customers to easily deploy next generation services, including HIPAA compliant security, network SLAs, engineering services, consulting, and equipment lifecycle management.

Currently we have agreements with 19 leading MNOs, the latest being in Brazil. For our OEM partners we're building an M2M bridge to a market in Brazil that is notoriously challenging to enter, but the potential market for mHealth there is huge.

However, we do a lot more than simply send biometric data back and forth over the airwaves. We partner with leading OEMs such as **TZ Medical**, who market arrhythmia monitoring devices, **PharmaSmart**, who are the world leader in the design, production, and distribution of innovative blood pressure screening systems; and **Cardiocom**, who are a leader in home health monitoring.

These companies, as well as many of our other partners, not just in the medical industry but across the M2M space have chosen Wyless as their supplier because of the broad range of services that they can get in one place, enabling them to deploy their solution more quickly and cost-effectively. That's why we built more and more services into our portfolio.

It's also why we acquired **ClearConnex** in 2012. Their core competence is helping our partners develop devices and applications in around half the time and expense that a typical engineering services firm would take. In fact, one of their earliest projects was working with a company that provides heart monitoring systems. ClearConnex's mantra is "start ahead, finish ahead" and it has gained significant traction, as covered in the October issue of **M2M Now.**

Wyless Connect is another business line and in this case the focus is around equipment lifecycle management, bundled with professional ➡

TZ Medical offer wirelessly connected cardiac arrhythmia monitoring devices

AERA CT

services, connectivity, even installation services, all of which has been a neglected aspect of the M2M industry. Our partners are now using us to configure, deploy and support the hardware that runs their solution. For example, we have facilitated the deployment of thousands of healthcare kiosks in drug stores and other retail locations. Most of these organisations won't let kiosks and other ancillary connected devices onto their corporate network, so they need a secondary network for those customers. Cellular is clearly the optimum way to go for cost, convenience and installation: wireless days instead of several wireline months.

M2M Now: The greatest success in mHealth services so far has been in North America. Is there any evidence that healthcare providers elsewhere are catching up? Can you give examples?

DM: Success has been realised primarily through innovation, but the fact that the US represents a huge contiguous market is a contributing factor, as it is a fact that healthcare costs are high, probably the highest in the industrialised world. Minneapolis is a hotbed of mHealth innovation: it's where major players such as Medtronics, **Boston Scientific**, and Cardiocom are headquartered.

Many European countries do their research and development work in the US prior to marketing the solution elsewhere. However, there are a number of very interesting homegrown developments. **Buddi** has a number of features that range from a simple alarm button, automatic fall alert and location. These features employ advanced satellite navigation technology to pinpoint a wearer's location and a Wyless service is then used to communicate between the buddi and a fully staffed, 24/7 emergency monitoring centre. And this product is now coming into the USA from the UK where it was developed.

I think of the States as a global incubator. We're also seeing more and more partners doing trials outside the States and of course when it comes to deployment they can use the same managed communication service as well as the lifecycle and project management services that they rely on Wyless to provide in the USA.

M2M Now: You recently gave a presentation at MobileCON. Can you cover the highlights?

DM: The title was 'Bringing the doctor to the patient' and it is exemplified in PharmaSmart's blood pressure screening systems, which can be used in the kiosks Wyless helped install in large retail outlets. These systems are employed in pharmacies, worksites, and medical clinics across North America, administering over 65 million BP tests each year.

However, the solution that literally brings the doctor to the patient is VGo's robotic presence solution that I mentioned earlier. VGo replicates a person – patient as well as doctor – in a distant location and the communications functionality is both high-touch as well as high-tech. It allows users to see, hear, talk and move around as if you were there.

M2M Now: How do you see the future? Where will Wyless be in five year's time?

DM: I see a very positive future and I'm not looking through rose-tinted glasses. Analysts are predicting an mHealth CAGR of between 60% and 80% and Wyless is doing its level best to match that figure. We've been growing at more than 50% year-on-year and we expect to meet and exceed that figure well into the future.

We will continue to invest in this sector as well as many others. However, I'd like to conclude on a different note: M2M brings significant benefits to everyday life via key verticals like energy monitoring, telematics and much, much more, but helping to create mHealth care solutions is something extra special because it's about helping people to live a better life. This is M2M at its truly most rewarding, and that's what keeps me so focused on building Wyless into a world class company, in service to such lofty goals.

"Cellular is the optimum way to go for cost, convenience and installation: wireless days instead of several wireline months."
Dan McDuffie, Wyless

M2M Now Jargon Buster

BYOD = Bring Your Own Device

CAGR = Compound Annual Growth Rate

MNO = Mobile Network Operator

OEM = Original Equipment Manufacturer

SLA = Service level Agreement

DECEMBER 10, 2013: WASHINGTON, D.C., USA
M2M Now: Money Talks mHealth

M2M Now's event, mHealth Money Talks (www.m2mnowevents.com) features a fascinating 'Demo Zone'. Starting at 2:00pm on December 10, 2013 at the Gaylord National Resort & Convention Center in Maryland, USA, the event opens with leading industry figures presenting two thought-provoking sessions. These are centred on vital commercial components associated with mHealth. Each session will comprise a keynote from an industry luminary, a Question & Answer session, a provocative 'real-world' presentation on each topic and a panel debate with representatives from the entire mHealth value chain. These include clinicians, payers, m-Health solution vendors, wireless network operators and business analysts.

Demo Zone – stand 515 HIMSS exhibition

The M2M Now mHealth Demo Zone is a 'must see' for all visitors to the exhibition. An area dedicated to showcasing best-of-breed M2M-based solutions, the Demo Zone gives you the opportunity to see, touch and have a go with current solutions from market-leading vendors.

Come and talk to the experts about how these solutions could radically transform your delivery of healthcare services, improve patient care and give you significant Return on Investment (RoI). Come, see, try:

PharmaSmart Inc, in association with Wyless

Demonstrating the PS2000. It is estimated that 1 in 4 people worldwide have hypertension (including 1 in 3 Americans), and that 9 out of 10 people will become hypertensive at some point in their life.

PharmaSmart is a world leader in the design, production, and distribution of innovative blood pressure screening systems to assist in the detection and management of hypertension. Their products and services are used by pharmacies, worksites and medical clinics across North America, administering over 65 million Blood Pressure (BP) tests each year. The PharmaSmart PS-2000 with connectivity is a device that measures blood pressure and pulse rate.

The blood pressure kiosk also integrates 'Smart Card' personal BP tracking. Each Smart Card is marked with a Unique Access Code that enables the cardholder to access their readings online using PharmaSmart's Blood Pressure Tracker™ patient portal. Blood Pressure Tracker™ users can also share a 'live link' to their personal Blood Pressure Tracker ™ page, allowing their loved ones or healthcare provider to view and interpret their blood pressure readings on an ongoing basis.

Gemalto

Mobile healthcare is a fast-growing area where secure, embedded cellular technology can provide clear benefits. Gemalto partnered with various parties from the mHealth ecosystem to build an end-to-end, standards-based demonstrator for telehealth

The PharmaSmart® kiosk technology is a new frontline tool to assist patients and pharmacists with their efforts to maintain healthy blood pressure and prevent heart disease and strokes

EVENT SUPPORTERS

where an M2M Java-powered Cinterion® wireless module by Gemalto links all involved elements efficiently.

Its Continua demo covers chronic care management scenarios to show how medical devices such as weight scales and monitors for pulse, blood pressure, blood glucose and medication can be mobilised by wireless transmission of measurement values. This demo combines the Java application environment and compliance with the **Continua Health Alliance** standards.

Vodafone

Vodafone Machine-to-Machine (M2M) connects previously isolated machines or devices to the internet, delivering new functionality and enhanced services without the need for human intervention. Supported by over 20 years' experience and 250 dedicated staff, Vodafone's Global M2M platform makes it easy for global businesses to centrally manage M2M deployments across multiple territories, with greater control and at a lower cost than previously possible.

Vodafone Global M2M is uniquely positioned to help you to take advantage of innovative M2M technology. Vodafone supports healthcare solution providers as they strive to improve the efficiency of healthcare operations, control costs and respond to patient demands for quality care.

Telit

GeaCom makes Phrazer, the Edison Award-winning medical device that helps caregivers work with patients overcoming language, gender, literacy, culture and other issues. Phrazer is revolutionising healthcare by employing the sciences of communication and information theory to reduce errors, dramatically improve efficiency and making valid care more portable.

Phrazer is a hand-held medical device that can gather vital patient information, while interacting with them to register, triage, treat and educate. Phrazer automatically populates the digital chart and keeps caregivers informed of the patients' issues and progress through a private audio channel.

When a patient enters a Phrazer-enabled medical centre they are handed a Phrazer, whether they speak ➡

English or another language, whether they are literate or not and whether they're a new or returning patient. Phrazer quickly identifies the patient's language and dialect (usually within 20 seconds), determines if the patient is new or returning and then begins gathering vital information accurately and efficiently. While the patient interacts with an onscreen caregiver who is language- and culturally-relevant, Phrazer sends key information to the caregiver's earbud audio system via a patented communication channel.

Phrazer shares the patients' important vital health status data with the caregiver, as well as important cultural considerations and prior health concerns. Through the use of patented and scientifically-validated methods, Phrazer has shown what a Telit spokesperson describes as, "absolutely shocking improvements in accuracy of information as well as speed of care".

In many cases accuracy is said to be improved by more than 40%, while speed increases by factors greater than three times – all while improving patient and caregiver satisfaction.

Phrazer: Accuracy can be improved by more than 40%

For more information go to:
www.m2mnowevents.com

Co-located with HIMSS mHealth
Tuesday 10th December - 2:00pm – 6:00pm The Maryland A, Level 2

Speakers and Panelists by Session

Chairperson: Chris Wasden, Global Healthcare Innovation Leader, PricewaterhouseCoopers

CONFERENCE AGENDA

Session A
Kent Dicks, CEO, Alere Connect
Chuck Parker, Executive Director, Continua Health Alliance
Dr. Li-Qun Xu, Chief Scientist, China Mobile Communications Corporation
Esteve Vallve, mHealth Product Manager, Orange Healthcare
Horst Merkle, Director Information Management Systems, Diabetes Care, Roche Diagnostics Corp.
Erik Kling, Vice President New Business Development, Vodafone Americas
Mathew Martin King Johnson, CEO, GeaCom and Phrazer
Dennis Kelly, Vice President of Sales, Telit Wireless Solutions

Session B
Clint McClellan, President & Chairman – Continua Health Alliance Senior Director, Business Development – Qualcomm Life
Dr Paul Frisch Chief of Biomedical Physics & Engineering at Memorial Sloan- Kettering Cancer Center
Dr. Li- Qun Xu, Chief Scientist, China Mobile Communications Corporation
Esteve Vallve, mHealth Product Manager, Orange Healthcare
Reid Oakes, Executive Director for Healthcare Technologies, Oracle
Erik Kling, Vice President New Business Development, Vodafone Americas
Bern Terry, VP Sales, VGo Communications Inc
Charles Kriete, Senior Vice President Sales, Wyless

SESSION A:
Consumer or Clinician – Who's Driving the Future of mHealth?
2:00pm – Keynote Presentation
"Moving the Needle: Decreasing Hospital Readmissions Through Intelligent mHealth Systems" Kent Dicks, CEO, Alere Connect

2:10pm – 1st Panel Debate
• Where will new consumer spending on mhealth come from?
• How can consumers gain confidence in the quality of medical apps and how can they find the validated information they need?

2:30pm – Case Study Presentation
"The Role of Start-up Incubators in mHealth" Kenneth Lowe, Gemalto

2:40pm – 2nd Panel Debate
• What is the role of medical entrepreneurs in taking mHealth forward-do they build consensus or divide the profession?
• What's the role for venture funds in driving future applications and stimulating innovation?

3:00 – Open mic Q&A with audience

3:15 – 3:30   Networking refreshment break, speakers/panelists available for further interaction

SESSION B:
mHealth 2020 Vision Delivering and capitalising on Connected Health
3:30pm – Keynote Presentation *"mHealth: Is it still in the Waiting Room?"* Clint McClellan, President & Chairman – Continua Health Alliance Senior Director, Business Development – Qualcomm Life

3:40pm – 1st Panel Debate
• What can we learn from mHealth deployments that have not yet performed as expected?
• Is the market just much slower to develop than expected?

4:00pm – Case Study Presentation *"The Intelligent Hospital: Adaptive Information Management"* Dr Paul Frisch, Chief of Biomedical Physics & Engineering at Memorial Sloan-Kettering Cancer Center

4:10pm – 2nd Panel Debate
• Who are the ideal distribution partners?
• What are the emerging, game changing mHealth technologies for the coming 18 months

4:30 – Open mic Q&A with audience

4:45pm – 4:55pm Wrap- up Presentation
Reid Oakes, Executive Director for Healthcare Technologies, Oracle

5:00pm – 6:00pm M2M Now Money Talks post event party!

Please join Oracle and M2M Now Money Talks for complimentary drinks and appetizers at: The Cadillac Ranch, 186 Fleet Street, National Harbor (right opposite the Gaylord main entrance). Strictly by invitation only

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**YOUR INVITATION: CUT ALONG THE DOTTED LINE - ADMITS 2**

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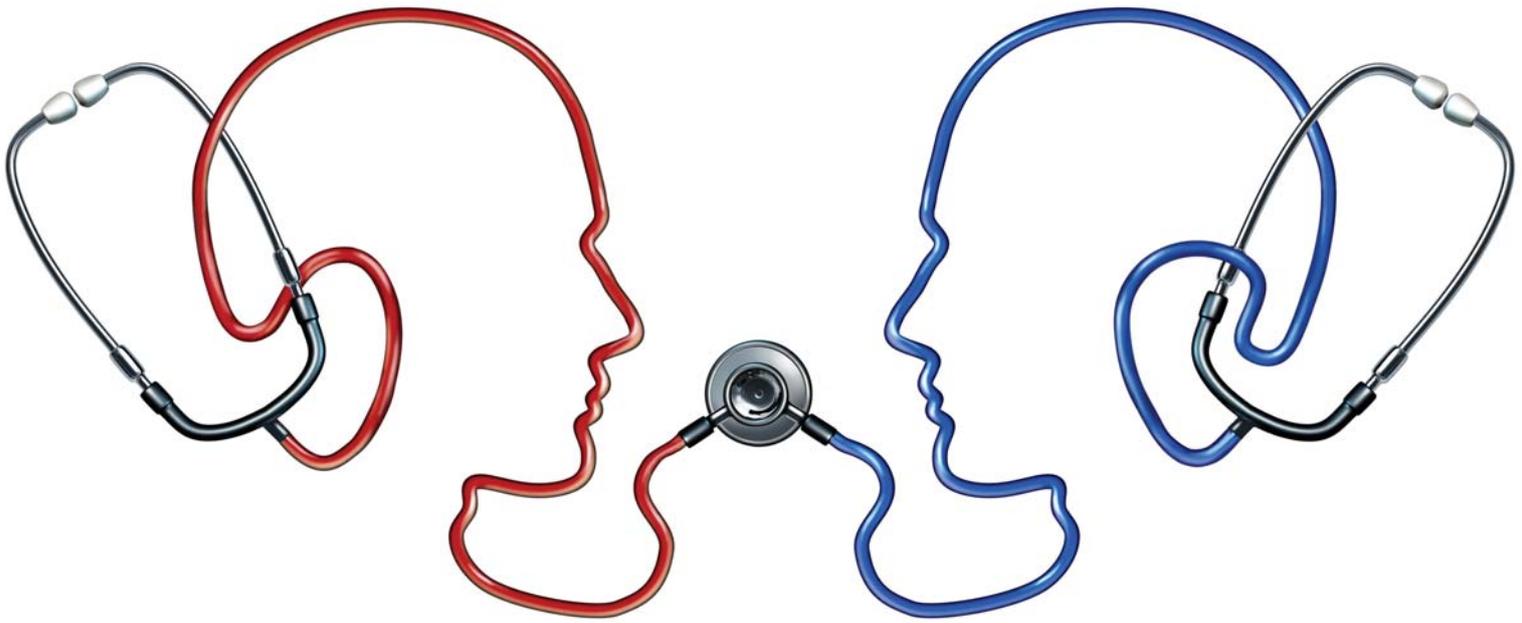
Building valuable new M2M health services

Across the healthcare value chain, organisations are realising the potential of embedding M2M technology into mobile health solutions. In this feature, M2M Now's deputy editor, Georgina Elrington, looks into what service planning processes the providers are going through, current and future mobile healthcare (mHealth) business models, and the technologies enabling them.

David Hicks, Oracle: "Today's healthcare market has two diverging business challenges

Mobile network operators (MNOs) have already begun exploring what looks set to be a vast opportunity in mHealth. In fact, most European telecom operators already have dedicated M2M business units for R&D, service development, and delivery.

Recent analysis from **Frost & Sullivan** identified that, after North America, Europe has considerable growth potential for machine-to-machine (M2M) healthcare. The indications are that the M2M revenues of telecom service providers in Europe will grow to €2.6 billion by 2016.

"MNOs are well placed to participate in shaping future healthcare delivery as they own the essential communications infrastructure needed for mobile communications to become a core tool in the industry," said Frost & Sullivan's information and communication technologies analyst, Malgorzata Filar. "They have also built trust with their customers and can supply user-centric services."

David Hicks, vice-president of worldwide ISV, OEM and Java Business Development at **Oracle**, told **M2M Now**: "Today's healthcare market has two diverging business challenges. Because of increasing costs and

"MNOs must build health-related resources and expertise"
Malgorzata Filar, Frost & Sullivan

regulatory requirements, more and more healthcare services are moving out of the hospital and into the home. While this change may be good for patients and insurance companies, it's also creating an explosion of internet-connected devices designed to track healthcare information. At the same time, there's been an increasing focus on HIPAA* requirements for privacy and security."

Service planning processes

While mobile device technology is emerging quickly, some hurdles remain regarding rapid adoption of M2M technologies in the sector. These include: the finalisation of a regulatory framework for mobile medical applications, perennial security concerns and the ability of provider organisations to effectively accept and manage big data from a growing universe of devices and formats.

Marc Perlman, global vice-president of healthcare and life sciences, **Oracle Healthcare**, told us that forward-looking providers are working to lay foundations for the future by focusing on the potential mHealth use cases likely to deliver the greatest impact. They're also keeping an eye on technology and regulatory developments to help ensure a shorter learning curve

when they are ready to move, as well as participating in pilot projects, collaborating with technology partners and healthcare coalitions.

"Providers are taking stock of their IT and professional resource requirements to support a nascent M2M initiative and create a platform for future growth – whether building it on-premise or looking to a cloud-based solution," said Perlman.

"mHealth technologies which transmit data directly from device to the data centre offer great promise in managing chronic disease as they can enable continuous monitoring well beyond the walls of the healthcare facility. Since these tools can monitor a variety of indicators, and provide immediate information to healthcare providers, they hold the potential to minimise or actually prevent costly incidents through early intervention," he said.

Also in the interest of early intervention, several UK Health Trusts (state-run administrative bodies) are trialling the new features of Evolve®, an electronic medical-record indexing and search solution from digital technology company, Kainos. Its healthcare analytics enable deeper insight into patient data and, potentially, identify hidden health issues. This means that more treatments or preventative actions can be administered outside the hospital environment. Acting before conditions escalate has clear benefits to the patient as well as on medical bills.

Mike Meers, chief information officer at **Ipswich Hospital NHS Trust** in the UK, is running one of the pilots. He said: "This is enormously exciting. It will mean we can extract valuable insight from sources that were previously unsearchable, and combine this with data from all sorts of other clinical and non-clinical systems, giving us a complete, amalgamated view of a patient all in one place. Once we have that, we can start changing the way we deliver healthcare."

Future challenges
According to advisory firm, **TechNavio**, as with critical connectivity systems in the defence and security industry, M2M healthcare will likely take the dedicated communication route. But that will require hefty standards-conformation, distance restrictions, and huge sunk costs.

On the other hand, long distance M2M can be widely accepted through conventional public cellular networks. For these systems however, latency is a major consideration, as critical signals will be competing with normal traffic. Network operators providing dedicated services will be able to deliver the urgency prevalent in the medical domain.

M2M providers in the healthcare sector will also have to combat significant degrees of device fragmentation, understand strict local regulations, and be capable of dealing with a broad range of industry stakeholders.

To successfully integrate M2M solutions into the healthcare system, they will have to offer value-added services along with basic connectivity.

"Providing value-added services such as legal compliance, analytics, consulting and integration will require the creation of a sustainable ecosystem of stakeholders and collaboration partners from both the healthcare and technology industries," said Filar of Frost & Sullivan. "MNOs must build health-related resources and expertise to be able to offer highly specialised M2M solutions. Designing a powerful M2M infrastructure supporting various healthcare needs and securing medical data hosting capabilities will also prove essential."

Enabling technologies
Vodafone is active in providing remote healthcare services including: Condition Management, Hospital to Home, and Assisted Living. In Portugal for instance, it is helping to speed up clinical decision-making regarding the care of young epilepsy sufferers. The solution allows doctors to view video electro-encephalogram (EEG) examinations remotely on a computer or smartphone. This enables them to analyse the seizures and make decisions quickly.

Remote healthcare, however, comes with its own set of issues, as Oracle's Hicks commented: "We have a situation that, on one side, is creating more and more healthcare data outside traditional healthcare settings. On the other side, in order to meet regulatory requirements, organisations need to make sure all that data is secure, protected, and private."

There is growing pressure in the health sector to implement strong authentication and procedures that ensure systems are protected from unauthorised access. One company looking into this is Gemalto, which is currently working with **LifeMed ID** on a solution to securely authenticate patient identities at **Mid Coast Hospital**, Maine, USA.

Hicks also identified that the way software is generated and implemented – for embedded healthcare related devices – is a key consideration. "If companies have to rewrite software each time a new device is taken to market, the costs will be untenable." He explained that embedded Java technology enables remote and secure updates with built-in data security at the device layer.

Dan MacDuffie, CEO of global M2M managed services company, **Wyless** summed it up well: "Remote and mobile healthcare services offered using embedded cellular are generating significant interest due to underlying demographic trends; an ageing population and continuing cost pressure on in-hospital care, so that remote homecare, self-diagnosing kiosks in pharmacies, and healthcare apps on smartphones and tablets will become the norm."

"Forward-looking providers are focusing on the potential mHealth use cases likely to deliver the greatest impact."
Marc Perlman, Oracle Healthcare

Marc Perlman, Oracle Healthcare: "Hurdles remain regarding the rapid adoption of M2M technologies in the health sector."

Transforming healthcare with the power of M2M

Advances in modern medicine are improving health and vitality; people are now living longer than ever before. Paradoxically, improved longevity and an increase in chronic conditions such as diabetes and heart disease put an enormous burden on healthcare providers. Fortunately, technologies such as wireless mHealth can help to solve this challenge.

> "Miniaturised wearable devices and functionality enabling automatic calls for emergency medical services."
> – Gemalto

mHealth is on the rise, and according to Research and Markets, a leading industry analyst firm, the industry will grow at a tremendous rate of 61% to reach US$26 billion globally by the end of 2017.

Gemalto machine-to-machine (M2M) technology is at the heart of mHealth solutions, providing reliable, secure connectivity along with cloud-based services that connect patients and medical devices to doctors and healthcare IT systems. Gemalto-enabled solutions enhance communication between care teams and patients, help physicians improve diagnosis and clinical decisions, and enable remote treatment and crisis interventions when needed.

Developers around the world trust Gemalto's proven technology to enable solutions to improve both outcomes for patients and the efficiency of the medical care system. For example, the **Philips** Respironics System One sleep therapy solution leverages Gemalto-enabled connectivity to remotely adjust prescription airflow pressure in devices that treat sleep apnoea, improving patient comfort and outcomes.

TZ Medical leverages Gemalto connectivity to mobilise heart monitoring in its Aera-CT™ device, improving detection and visibility of heart arrhythmias. **iLOC Technologies** uses a Cinterion solution for its TRiLOC™ GPS Personal Locator Device to help locate and remotely communicate with people who have autism, dementia or Alzheimer's disease. Gemalto-enabled cold chain solutions are also monitoring and protecting environment-sensitive cargo including medical supplies, medicines and vaccines throughout distribution and delivery.

Gemalto Cinterion® Technology for mHealth: M2M modules, MIMs, services and SensorLogic

Gemalto provides a unique combination of solutions and services

that improve transparency in medical care, providing easy access to medical data while maintaining strict requirements for security and patient-doctor confidentiality. The broad portfolio of M2M wireless modules offers the right capabilities for any mHealth scenario, including miniaturised form factors for wearable devices and functionality that enables automatic calls for emergency medical services.

Cinterion Machine Identification ModulesTM (MIMs) provide encryption and secure connectivity to mobile networks. Flexible subscription management services allow implementers to manage solutions remotely, and the cloud-based SensorLogic Application Enablement Platform connects mHealth applications to healthcare provider IT systems, providing smart data from devices to physicians and care teams.

The industry's premier full-spectrum offering provides a single source of M2M technology and expertise for mHealth developers, helps reduce design complexity, and speeds time to market for compelling new applications.

Java strategy simplifies and speeds mHealth development

Embedded Java is offered across Gemalto's entire Cinterion portfolio. As the most pervasive open standards programming language in the world, Java helps to facilitate easy end-to-end interworking connecting data, devices and back-end IT systems. It also eliminates the need for dedicated processors and memory chips and simplifies design complexity. Simply put, Gemalto's intelligent Java strategy simplifies, speeds and elevates mHealth solutions, helping to drive the industry to the next level.

It's clear that mHealth is revolutionising healthcare, improving both the quality of care and patient outcomes, while reducing costs and hospital stays. Gemalto's mHealth expertise gives companies the freedom to gain a competitive edge in this rapidly expanding industry. With Gemalto as a partner, mHealth companies, healthcare providers, and patients are all looking a lot healthier!

Meeting the threat of medication non-compliance

Vaica Medical is a Telit customer in the mHealth space. Headquartered in Israel, the provider of cloud-based medication compliance and telehealth solutions for chronic patients recently announced the second generation of its flagship product, SimpleMed+ which employs Telit's GC864-QUAD V2 for mobile connectivity.

The product and the company's cloud-based service portal aim to provide effective, easy-to-deploy-and-use solutions to curb healthcare spending, treating chronic conditions that are believed to represent 90% of all healthcare costs. Medication non-compliance is a major threat to the US healthcare system. About 125,000 people die every year from it in the US alone. That's three times as many people as die in car accidents there.

SimpleMed+ is targeted at hospitals, health management organisations (HMOs), assisted living facilities, and other care organisations. It addresses a real need these organisations have of lowering the high 40% hospital readmission rate attributed to medication non-compliance. The product will start selling initially in the United States, Canada, Brazil, New Zealand and Australia. SimpleMed+ also incorporates the functionality of a panic alarm, allowing it to be integrated into existing personal emergency response services.

With US government statistics showing that compliance with prescriptions by chronically-ill patients declines to 50% after six months; and to 33% in five years, the pharmaceutical industry is also looking for solutions like SimpleMed+. And, since the average chronically ill patient takes over five medications daily, a number of pharmacy chains in the USA and Canada are designing customer programmes around the device and service which have shown in clinical trials

to improve prescription-taking compliance to 95% over extended periods. Vaica is already working on another solution that works with pre-loaded blister packs from the pharmacy.

Healthcare costs cut

With 19% of patients admitted to hospital returning within 30 days, medicine compliance is a direct way that costs could be slashed in a meaningful way. Vaica handles each country differently. It does not envision selling to customers directly but rather to homecare provider companies, pharmacies and in the United States to HMOs that have a direct interest in reducing healthcare costs resulting from hospital visits, particularly readmissions which can be avoided with better medication regimen compliance.

The Quad-band 850/900/1800/1900 MHz GSM/GPRS GC864-QUAD V2 is designed for applications like SimpleMed+ that need a compact package and a board-to-board connector. The module also allows a SIM holder to be mounted on its back and is used in the Vaica Medical product. This option reduces footprint and integration costs.

The xC864 Unified Form Factor family includes GSM/GPRS, UMTS/HSDPA and CDMA 1xRTT air interfaces in cellular modules featuring a common 30x36.2 mm footprint with the same 80-pin board-to-board connector.

"With 19% of patients admitted to hospital returning within 30 days, medicine compliance is a direct way that costs could be slashed in a meaningful way."

SimpleMed+ is targeted at hospitals, HMOs, assisted living facilities, and other carers

SimpleMed+ which employs Telit's GC864-QUAD V2 for mobile connectivity

Wyless and BIP Help are 'focusing on the vulnerable'

The subject of mHealth or e-medicine is gaining substantial momentum around the world, and covers a broad range of subjects, says Steve Priestley. Today a variety of specialist companies and channels to market are providing everything from in-home monitoring to critical care applications.

The author is Steve Priestley, EMEA managing director, Wyless

Wyless partners many of these organisations in the arena of managed connectivity and hardware. But we have gone a step further in partnering with a number of companies to create a complete turn-key solution in the arena of lone worker and individual emergency management and support.

The subject of extending individual freedom whilst suffering from debilitating illnesses such as Alzheimer's or Dementia or simple age-related issues has gained traction in many communities. This is often related to the care-giving community; care which can be provided by family and friends or professional care providers and the continuing interaction between the two. The needs of both sets of users are diverse but connected by the issue of security and the ability to deliver ongoing support.

Partnership

Our partnership with **BIP Help** has recognised the needs of both sets of users and aimed to create a 'plug-and-play' environment which delivers the key needs for each. In the case of the individual we have created a solution which puts security and location management tethered to the care giver and supported through a 24/7 Emergency Call Centre. This provides alarm and SOS management and a two-way voice communication path to ensure the individual needs are understood and managed effectively. This simple but effective tool allows the user to extend the normal boundaries of their day-to-day life by providing a safety net in the event of emergency.

For the professional user connected with government organisations or professional care companies, the issues go beyond simple worker security and safety to elements such as route management, entry and exit to premises, travel patterns, optimisation and adherence to a growing set of regulatory and legislative environments. These users are often tied to more than one service user and need to manage their time and duty effectively.

The partnership in this instance provides a solution which enables individuals to be dynamically connected with the care giver, providing a voice communication tool set with a location management environment. This location management effectively allows us to extend the standard SOS and security features from the lone worker and individual and, through the software platform, to enable compliance management to the business rules and processes dictated by the enterprise.

Turnkey solutions

The devices, connectivity, call centre and software are provided as a turnkey environment and allows users to get on line quickly and easily.

The partnership goal of Wyless and BIP Help is to simplify the deployment of a complex technology into the broader community and provide a better, safer, working and living environment for both professionals and the vulnerable individuals in our society.

mHealthnet
Cellular Network
Call Centre
Tracking Platform
GPS Network
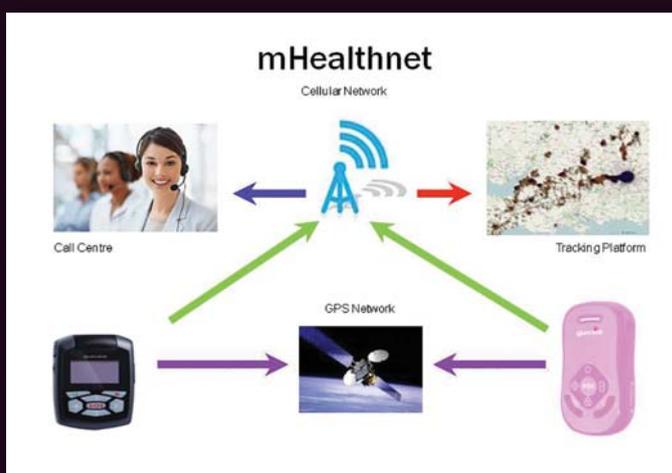
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It's good to be well connected.

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