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TRANSPORT 360

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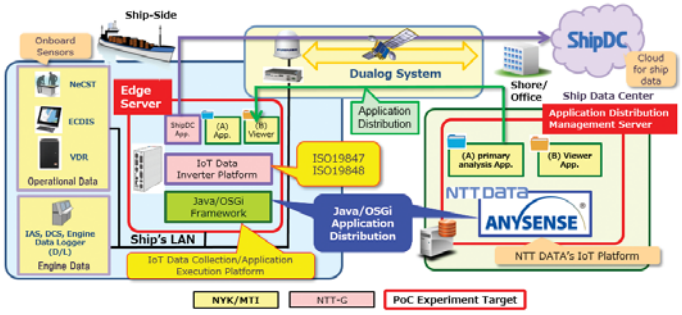

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software AG

(Cover sponsor) Software AG (Frankfurt TecDAX: SOW) helps companies with their digital transformation. With Software AG's Digital Business Platform, companies can better interact with their customers and bring them on new 'digital' journeys, promote unique value propositions, and create new business opportunities. In the Internet of Things (IoT) market, Software AG enables enterprises to integrate, connect and manage IoT components as well as analyze data and predict future events based on Artificial Intelligence (AI). The Digital Business Platform is built on decades of uncompromising software development, IT experience and technological leadership. Software AG has more than 4,500 employees, is active in 70 countries and had revenues of €879 million in 2017.

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IoT Now's Transport 360 bucks the trend

These days it's rare that publishers launch a new magazine, but that's what we're doing here. The publishers of **IoT-Now.com**, **IoT Now magazine**, **IoTGlobalNetwork.com** and **IoTNowTransport.com** are pleased to be able to extend their reach with a global print publication that is also available digitally. So, what will you find in **IoT Now Transport 360**?

Well, we are focusing on Automotive Transport, Fleet Management and Logistics. Our experience has shown that these are the sectors that are being most heavily impacted by new services enabled by the Internet of Things (IoT). In this launch issue we bring you News, Views, Events, Case Studies and Interviews from around the world. Our Front Cover interview is with Sean Riley a director of Germany's Software AG (page 8) and it looks at the costs and opportunities enabled by IoT, Artificial Intelligence (AI), and Data Analytics.

Led by IoT Now Transport's Consulting Editor, Johan Fagerberg (CEO of Sweden-based Berg Insight), we investigate the accelerating convergence of Information Technology (IT) and Operations Technology (OT) (page 24), and how transportation safety and service efficiency are being improved by embedded IoT solutions (page 26). We describe how to choose the right IoT platform for smart transport (page 28). And we compare advances in multi-modal public transport (14) and commercial freight movement (12).

Finally, it is my pleasure to introduce Annie Turner, who has been appointed as Editor of **IoTNowTransport.com**. Annie is a highly experienced journalist who has been writing about technology and its impact on industry, the economy and society since the 1980s. In her first article for us (page 12) she tells you how to keep your cool in intermodal transport.

We all hope you enjoy Transport 360. Connect with us on Twitter **@IoTNowTransport**

Jeremy Cowan, Editor
Subscribe free for quarterly issues at **http://bit.ly/2vsbVjd**

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We are always proud to bring you the best writers and commentators in M2M and IoT. In this issue they include:

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EDITORIAL ADVISORS

Cab Digital Media and Telstra launch TaxiLive solution for real-time safety messaging and ads

Australia-based Telstra and Cab Digital Media, a Sydney-based start-up, have jointly launched TaxiLive, a custom-designed digital billboard for the rear of premium taxis. The digital platform allows safety messages and advertising to be sent to the taxis depending on their location, the time of day and even the weather.

The 'smart' taxi-backs use GPS-enabled smart screens that Cab Digital Media connect to and remotely manage via the unrivalled coverage and capability of the Telstra mobile network.

Najeeb Aftab, co-founder and head of Sales and Partnerships at Cab Digital Media said, "The idea for TaxiLive was born one day when Shafiq Khan and Sajid Khan, now managing director and CTO of Cab Digital respectively, had spent an hour in traffic following an accident on the Sydney Harbour Bridge. They thought, what if we could tell motorists that there was an accident and to take an alternate route? Three years later, we're thrilled to be launching what we believe is one of the smartest digital billboards in the world.

"The solution was originally built to display safety messaging, for example accident alerts, traffic updates and weather warnings, but we found the applications for the media and advertising industry, where you can specifically target consumers based on location or time of day, are also very advantageous."

Telstra and Cab Digital Media developed the Internet of Things (IoT) solution together, with Telstra sourcing and connecting the technology components.

Martijn Blanken, group managing director of Customer Management and Sales at Telstra Enterprise, said, "Telstra's IoT team has worked with Cab Digital Media's engineering team for the last two years to co-create TaxiLive. Inside each TaxiLive is essentially an advanced computer with in-built GPS that is connected via Telstra's mobile network. At headquarters, Cab Digital Media uses an IoT platform to remotely manage the screens.

Cab Digital Media's longer-term ambition is to partner with roadside authorities to share the invaluable GPS data generated from each TaxiLive unit which could contribute to future transport, infrastructure and congestion reduction initiatives.

The first taxis fitted with TaxiLive are on Sydney roads today, featuring advertising from brands including Channel 10 and Telstra. Cab Digital Media expects to have more than 945 cabs fitted with TaxiLive nationally by November 2018.

XSun selects Sierra Wireless device-to-cloud IoT solution for solar-powered autonomous drone

Sierra Wireless (NASDAQ:SWIR) (TSX:SW), a provider of integrated end-to-end solutions for Internet of Things (IoT) applications, reports that XSun has selected its device-to-cloud IoT solution for its solar-powered Unmanned Aerial Vehicle (UAV). This includes including AirLink® RV50 gateways, multi-operator smart connectivity services and the AirVantage® IoT platform.

XSun's SolarXOne is designed to be autonomous in energy and flight control to enable long-endurance flights for agriculture, maritime, land and industrial infrastructure surveillance. XSun, a start-up based in France, architected the 4.5m-wide SolarXOne with a wide surface of solar panels and a large variety of sensors, giving it the ability to fly autonomously for days, covering long distances while collecting data.

Supported by distributor Sphinx Connect France, XSun chose Sierra Wireless' device-to-cloud solution to enable reliable connectivity and real-time data transmission, which allows its customers to see exactly what's happening on their sites at any time, so they can intervene quickly, even immediately, in the event of an emergency.

The Sierra Wireless solution also enables XSun to measure data consumption and manage its entire fleet lifecycle from its control centre.

"Our mission is to create a UAV with the maximum level of autonomy to release the full potential of drones," said Benjamin David, CEO and founder of XSun. "Sierra Wireless provided us with a complete solution to cover all aspects of communication and monitoring, including multi-operator coverage to ensure a continuous connection between the drone and XSun's control center. This allows us to focus on bringing a drone to market that can secure critical infrastructure, protect the environment and save lives."

Critical infrastructure, such as oil and gas pipelines, railways, and electrical grids, must be monitored on a regular basis. Today, this is often done by a piloted helicopter, which has a very high cost and limited range. The SolarXOne is a much more cost-effective, energy-efficient and safer option, plus the drone can fly at a lower altitude, providing higher resolution data.

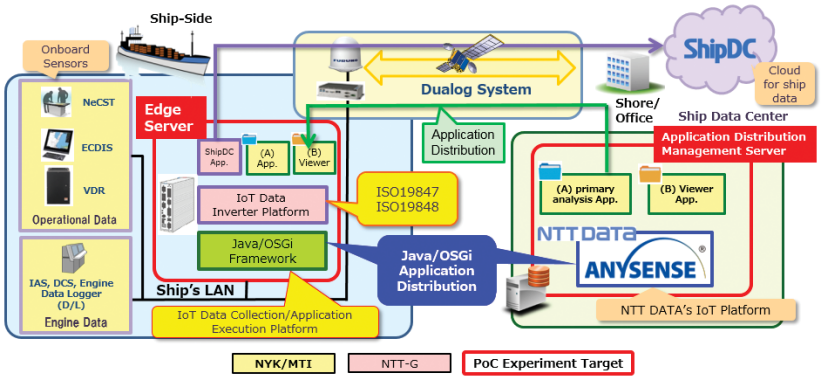
NYK Line and NTT conduct joint test of next generation onboard IoT platform

Nippon Yusen Kabushiki Kaisha (NYK), MTI Co. Ltd., Nippon Telegraph and Telephone Corp (NTT), and NTT DATA Corp have carried out a proof-of-concept experiment for a next-generation onboard IoT platform. The test was held aboard Hidaka, a domestic coastal vessel owned and operated by part of NYK Group.

The NYK Group (NYK and MTI) previously developed a ship information management system (SIMS) that enables the gathering, monitoring, and sharing of detailed data between ship and shore, with the aim to promote safe, efficient operations. The data includes information on the operational condition and performance of oceangoing vessels.

Last September the four companies began a collaboration to make use of NTT edge-computing technology to develop a next-generation onboard IoT platform by adding to SIMS a new system that would enable the remote distribution and management of onboard applications from land offices. This experiment was conducted using NTT DATA's ANYSENSE IoT platform and the communication company's expertise developing infrastructure that makes use of IoT solutions.

This platform is also said to be compliant with onboard IoT international standardisation being devised by the Japan Ship Machinery and Equipment Association.



Companies offer global IoT connectivity for real-time tracking of personnel, vehicles, vessels and aircraft

San Jose, California-based Aeris is collaborating with TracPlus of Dunedin, New Zealand to offer an IoT connectivity solution that allows TracPlus and its customers to track their personnel and physical assets in real time.

The Aeris® IoT Services platform is being used by TracPlus, a global tracking, communication and collaboration solutions provider, to allow companies and organisations to monitor and communicate with personnel fighting fires, performing rescue missions, installing powerlines, saving vessels and providing other land, sea and air services. Aeris IoT Connectivity services reportedly enables TracPlus to improve its service delivery and increase service radius.

TracPlus is a global service providing real-time tracking, event and messaging with personnel using vehicles, vessels and aircraft. TracPlus solutions span desktop, web and mobile platforms. For example, Aviation Services Unlimited of Rome, N.Y. uses TracPlus' solution to track its helicopters and provide aerial services to utility companies, inspect and maintain electric transmission lines, patrol ground-over-gas lines and provide emergency services during power outages.

TracPlus was founded by Chris Hinch following a tragedy in May 2003 off New Zealand's North Otago coastline when a fishing vessel carrying five passengers capsized. Three perished due to a record-keeping error at the national search and rescue headquarters that sent a rescue aircraft approximately two and half hours away instead of dispatching a helicopter located 20 minutes away. TracPlus has offices in USA, New Zealand and Chile, and serves customers in more than 35 countries.

Mike Slattery, general manager and chief pilot, Aviation Services Unlimited, commented, "We selected TracPlus because it allows us to track our assets in real time, which is mission-critical when working with our staff and providing our aviation services. TracPlus provides excellent customer service and support. I can sleep at night knowing that TracPlus' tracking and communication solution, enabled by Aeris, is helping us monitor and manage our two most important assets, personnel and helicopters."

Christina Richards, VP of Global Marketing at Aeris added, "Aeris is an Internet of Things industry leader and through our work with TracPlus we can allow their customers the opportunity to track in real time their most important assets, personnel and equipment. The Aeris IoT Services platform is built for IoT and has been globally tested at scale. For more than a decade, we have unlocked IoT value for businesses and look forward to helping TracPlus be the preeminent provider of real-time tracking of assets by land, sea and air."

JDA begins research collaboration with MIT to help digital supply chains embrace the intelligent edge

Dr. David Simchi-Levi

JDA Software, Inc., has announced a multi-year collaboration with the USA's **Massachusetts Institute of Technology (MIT)**. This is focused on joint research to create new and innovative capabilities within the supply chain utilising intelligent edge technologies like machine learning, artificial intelligence (AI), Internet of Things (IoT) and advanced analytics.

JDA will work closely with MIT's Institute for Data, Systems and Society (IDSS), a research and innovation team led by MIT's Dr. David Simchi-Levi, professor of engineering systems and supply chain expert, to develop new solutions that predict supply chain demand, increase cognitive responses and embrace the intelligent edge. Simchi-Levi is the former co-director of Leaders for Global Operations at MIT.

Desikan Madhavanur

"It is more critical than ever to infuse innovation into every aspect of the supply chain, as edge technologies such as the IoT and artificial intelligence are essential to digitally transforming supply chains. This collaboration allows us to tap into the extraordinary mindshare at MIT to accelerate the research into more intelligent and cognitive capabilities moving forward," said Desikan Madhavanur, executive vice president and chief development officer, JDA. "We are excited to be working on the future of supply chain with MIT to double-down on researching enhanced, innovative and value-driven supply chain solutions."

ZEDEDA emerges from stealth to power real-time apps at the edge

Said Ouissal of ZEDEDA

A start-up company, ZEDEDA, has emerged from stealth mode and closed US$3.06 million (€2.47 million) in seed-stage funding. ZEDEDA is working on a secure, cloud-native approach to scaling out the real-time edge applications for solutions ranging from self-driving cars to industrial robots.

"Tomorrow's edge computing environment that enables digital transformation will be distributed, autonomous and cooperative. The edge is complex and not only has to scale out securely, but simultaneously must become friendlier for app developers. That's the problem we are solving at ZEDEDA," said the company's CEO and co-founder, Said Ouissal.

"It will require a drastic shift from today's embedded computing mindset to a more secure-by-design, cloud-native approach that unlocks the power of millions of cloud app developers and allows them to digitise the physical world as billions of 'things' become smart and connected."

Kevin DeNuccio

ZEDEDA will use the funding for continued research and product development, investment in community open-source projects for edge computing as well as further investment in sales and marketing initiatives. ZEDEDA investors include **Wild West Capital** and **Almaz Capital**, whose funding was part of a broader group of investors, some of whom also invested in IoT/edge companies **Theatro** and **Sensity Systems** (now in **Verizon**).

In the coming wave of pervasive computing, real-time apps, cyber-physical systems and data services such as machine learning and analytics will become common place. ZEDEDA envisions an open ecosystem and a completely new technology stack that creates a service fabric essential to achieving the hyperscale that will be required in edge computing.

"A new paradigm and massive innovation is needed to meet demand for IoT and edge computing," said Kevin DeNuccio, founder of Wild West Capital and ZEDEDA's lead investor. "Massive shifts in technology, including the proliferation of IoT, paves the way for industry disruption, which large incumbents tend to inhibit.

ZEDEDA is currently accepting sign-ups for early access to its platform which will move into customer trials in the first half of 2018.

Eutelsat commissions its first low earth orbit satellite designed for the Internet of Things


Jean-Hubert Lenotte of Eutelsat

Eutelsat Communications, one of the leading satellite operators, has commissioned a nano-satellite from manufacturer **Tyvak International SRL**, a subsidiary of **Terran Orbital Corporation**, an aerospace provider of nanosatellite and microsatellite vehicles and services.

Eutelsat LEO for Objects (ELO) will be used to assess the performance of low earth orbit (LEO) satellites in providing narrowband connectivity for objects. The satellite operator will be drawing on the technology of Sigfox, which runs a global narrowband network dedicated to the IoT.

Low earth orbit is particularly well-suited to narrowband connectivity for objects. It offers a satellite link anywhere in the world, is complementary to terrestrial IoT networks, and does not impact the cost or the energy consumption of the objects. ELO, scheduled for launch in 2019, will backhaul information from objects located in areas that are not served by terrestrial networks and offer redundancy on existing terrestrial network coverage.

Sigfox will work with Eutelsat on two aspects: analyse the spectrum used by the satellite in ISM frequency bands; and process data from objects. ELO will also test connectivity in other frequency bands. The synergies developed through the partnership with Sigfox, as well as with other strategic alliances in the telecom industry, should open up new opportunities for Eutelsat in this fast-growing market.

Jean-Hubert Lenotte, chief strategy officer at Eutelsat, commented: "With the expansion of the Internet of Things, new services are being developed in a wide range of sectors including smart cities, the mining industry, agriculture and logistics. We are delighted to be exploring new avenues through the development of this nano-satellite, which once again demonstrates the intrinsic complementarity between terrestrial networks and satellite technology. By analysing the compatibility of LEO and connected objects, and working with recognised partners in the field, Eutelsat aims to provide an innovative solution which will meet the needs of future clients."

Located on a sun-synchronous orbit between 500 and 600 km in altitude, the satellite will collect data from connected objects across the globe equipped with the same omni-directional antennas already used by terrestrial IoT networks. Data will then be transmitted daily to a ground station located on Svalbard, a Norwegian archipelago in the Arctic Ocean.

CMS appoints Rory Maher as sales director to champion real-time crash detection


Rory Maher

Collision Management Systems (CMS) has appointed Rory Maher as sales director for Fleet Solutions to lead account development with the UK's leading telematics OEMs and providers.

Maher will play a key role in promoting CMS's software as a service (SaaS) platform, which turns real-time collision data into significant insurance savings. Providing actionable information to insurers within one hour of an incident, CMS has been proven to cut the cost of each claim by at least £1,600 (€1805.08) which can dramatically boost telematics' return on investment.

Formerly sales director at Trimble, Maher led the sale and delivery of telematics and field service management solutions for four of the five largest fleets in the UK. He brings considerable market experience from this and previous senior sales positions at **Vodafone** and **C&W**.

Commenting on his new role, Maher says, "CMS offers telematics businesses a unique value-add for their customers. Its ability to cut claims costs, future-proof technology and reduce the time and effort of handling vehicle generated big-data will give them a significant competitive edge.

"And, because it's agnostic, seamless, and easy to integrate, it can be deployed swiftly, effortlessly and to scale. We are already partnering with some of the UK's leading telematics providers and anticipate several major announcements in the months to come."

SmartDrive chooses Digi ConnectCore 6UL as its driver monitoring and fleet management platform

Digi International, a global provider of Internet of Things (IoT) connectivity products and services, reports that SmartDrive, a provider of telematics and fleet management services, has selected the Digi ConnectCore 6UL secure, wireless System-on-Module (SOM) as the development platform for its recently announced DriveOps GPS Real-Time Fleet Management system.

SmartDrive faced a significant business challenge in reducing the time-to-market of a production-ready next-gen telematics device that could be easily installed using a car's built-in 12-volt power outlet and the company's own embedded cloud-based software built on Amazon Web Services' (AWS) cloud services platform. The new device, which required relatively little development overhead, replaces SmartDrive's existing OBD II dongle.

SmartDrive recognised the value of Digi's complete out-of-the-box software support in the Digi ConnectCore 6UL product development platform, which does not require porting of the OS, the development of wireless drives, or obtaining certifications as part of the development process. These capabilities allowed SmartDrive to spend more time on application development and dramatically less time on hardware development, shortening the process to three months.

The compact 29 mm x 29 mm x 3.5 mm form factor of the Digi ConnectCore 6UL assisted in achieving the target product size, including sensors, GPS, and LTE modem, for a standard 12-volt vehicle power outlet device enclosure. SmartDrive users can reduce accidents as well as the cost of fuel and insurance by optimising their driving behaviour.

"The configuration flexibility of the Digi ConnectCore 6UL SOM is essential to our new hardware platform, allowing us to focus our development resources. The Wi-Fi option allows us to expand our capabilities with new sensors or other hardware such as cameras. The Digi roadmap with cellular connectivity integration is also helpful for future developments." said Retsu Kitagawa, CEO, SmartDrive.

> **There are several factors driving up the cost of transportation in North America, and those factors all converge on the transportation operator**

Costs and opportunities rise as transport providers deploy IoT, analytics and AI for automotive and fleet management

In our featured interview Sean Riley, Global Manufacturing and Transportation Industry director, Software AG talks to IoT Now Transport 360's editor, Jeremy Cowan about the wide range of possibilities and problems facing the transport sector as it deploys the available new technologies.

Transport 360: Autonomous vehicles are clearly going to be a key part of logistics in the future. Which are the greatest hurdles to overcome first; the technical, regulatory or public opinion issues? And why? How long do you envisage this taking?

Sean Riley: The first hurdle to overcome will be the technical viability of autonomous vehicles. While efforts have been made for several years to bring this to fruition, the technology still requires a significant amount of investment. This investment will be focused on ensuring functionality from a safety perspective, as well as focused on driving down the costs of the technology and hardware needed to support the systems. Ensuring that the costs are acceptable to the logistics industry will enable an easier path to adoption of the technology.

Secondly, the regulatory and public opinion hurdles will have to be addressed in parallel and will be a much ▶

more difficult and longer process to overcome. This will be impacted by various transportation unions and trade groups pressing to delay or not allow autonomous vehicles at all, and could stifle the entire initiative. By focusing on cost, viability and safety during the development and trial process, the regulatory approval process will be eased, but significant challenges from interest groups will still be a long-term issue to resolve.

A third area that will impact this that doesn't get discussed frequently is liability insurance. Insurance models will have to be significantly adjusted to compensate for an autonomous vehicle. While this seems like an issue that will be worked out, how does an insurance provider gauge the effectiveness of code, the impacts of product updates and the setting of baseline liability rates? This is also an issue that can be overcome, but it won't be completed without a degree of focus.

T360: What factors are causing transportation costs to rise quickly now?

SR: There are several factors driving up the cost of transportation in North America, and those factors all converge on the transportation operator. The first factor is the enforcement of the hours of service regulation which is causing operators to be less available.

Exacerbating this issue is the mandated usage of eLogs, which ensures that operators only drive hours that they actually have and stop when required, even if they are in the middle of a delivery. When an aging North American infrastructure coupled with higher levels of congestions is added, the issue of operators running out of time while en route can become more than a nuisance but a major issue.

Lastly, the operator shortage is requiring providers to increase per mileage pay and sign-on bonuses to entice more operators into the market and more to their companies. This last remedy will take time because operators require training and certification. Additionally, should the pay increase not have the impact that is desired, a change in the per mile pay structure could occur. Driver time could change from a pure per mile rate to a per mile and time rate which would have a broad impact on the trucking market in North America. In short, there is a storm of issues that all have significant impacts on operator cost which is driving transportation costs to increase.

T360: How can the IoT and advanced analytics play a role in cutting these costs? Is it through predicting maintenance requirements and synchronising arrivals and departures? ▶

“IoT coupled with streaming and predictive analytics will ensure operators are as productive as possible by removing, or minimising, impediments to operator driving time optimisation

Sean Riley, Global Manufacturing and Transportation Industry director, Software AG

While trucking has particular limits on how fast, how slow and what routes can be taken, these are variables that would also be analysed when formulating the best time to arrive

SR: IoT coupled with streaming and predictive analytics will ensure operators are as productive as possible by removing, or minimising, impediments to operator driving time optimisation. Precious driving time will not be used waiting for emergency maintenance or for other assets to become available like dock doors, containers or yard spots. Multiple transportation assets can be optimised to arrive exactly together, and notifications of exact arrival times will be provided to facilities so they can load or unload product immediately upon arrival. This is completed by providing direction to operators to understand the best speed to reach the destination, optimise fuel consumption and operator time.

While trucking has particular limits on how fast, how slow and what routes can be taken, these are variables that would also be analysed when formulating the best time to arrive. This functionality will be especially valuable to drayage operators who typically incur delays at loading and unloading points at ports. This also means that security check-ins and dock door assignments can be completed based upon electronic notifications provided by the transportation asset before reaching the destination, rather than a notification provided by the driver upon arrival. Rather than using a basic geo-fence determination, ETA calculations can be used to provide a more accurate arrival time.

If an operator is arriving later than planned, this too will be automatically communicated in advance to allow the receiving WMS to compensate and plan for the new expected ETA. This is another advantage of using ETA calculation rather than a geo-fence. A geo-fence can be used to provide entry, or lack of entry, into an area, but it cannot determine when the arrival will occur and that is the critical aspect to ensuring operator time is always maximised.

T360: Can you blend driver eLog data with route data and predict if a shipment will reach its destination before the driver times out?

SR: Blending operator eLog data with ETA will be critical to understanding when a load will actually arrive and to compensate for needed product that is delayed due to weather, traffic or other environmental issues that could occur requiring the operator to use time sitting and not covering miles. Having each piece of data on its own provides value, but the ability to merge the two pieces of data to truly understand delivery assurance in real time will provide greater route flexibility to planners that have this functionality as opposed to those that do not.

The alternative will be to limit the allowable distance for a route to guarantee delivery prior to timeout or to lengthen the amount of time required to complete the shipment. Both of these methods could be utilised to compensate for expected delay times which may or may not occur, or occur at a different severity level than planned. And both of these methods would increase cost by limiting operator range in some instances. The alternative, blending eLog data with route data to predict route duration and ETA, will ensure that delivery time requirements are met and costs remain constant.

T360: How can you ensure turnaround times at shipper/receiver facilities are met, or ensure the penalties match the actual time detained and on-time attainment?

SR: Penalties are always a difficult issue to discuss because they are typically imposed and argued based upon historical data that wasn't perfectly validated. A freight bill shows up with a detention or other charge and a debate ensues about the operator arriving on time or late, or that the operator wasn't delayed as long as stated. Both of these issues are based upon reports made by the operator and not always based upon geo-location data.

With real-time data being collected, delay charges can not only be sent to shippers in real time, but notifications of impending delay charges can also be sent. For example, if an operator arrives on time, but is then delayed 20 minutes awaiting security check-in and being assigned a dock door, and unloading and reloading takes 70 minutes, and an outbound security check takes another 20 minutes, the operator has spent ▶

nearly two hours at the location and a detention charge could be applied. However, this type of turnaround isn't out of the ordinary, and a charge may not be requested.

In reality, 40 minutes or seven percent of the operator's drive time was spent without any value being added. For a fleet of 500 drivers, that is 333 man-hours spent idle per pick-up or departure point. Additionally, by providing position data as part of an eInvoice, the arrival and departure time become indisputable.

T360: What role can Artificial Intelligence (AI) and Machine Learning (ML) play in cutting costs, rolling out new services and generating new revenues for transport operators?

SR: Artificial Intelligence and Machine Learning will be the core for providers creating new revenue platforms and providing new services to customers. While the term "artificial intelligence" encompasses a wide variety of capabilities that can be applied to a large quantity of uses, predictive maintenance, route or pathfinding, capacity planning and autonomous vehicles are a few examples of applied AI.

For example, AI is a crucial part of a predictive maintenance program as it uses the data obtained from embedded sensors to predict remaining useful life of components to understand when maintenance will need to be performed to maximise the life of the component and mitigate unplanned downtime. AI can also be used by providers to continuously optimise routes and serve as a platform to join multiple operators to complete a delivery when an operator times out before the deliver is completed. This has the potential to be a powerful platform that changes how logistics operates from contracting with a single provider to contracting for a shipment that is moved by multiple transporters without the shipper having to coordinate the operations.

When multiple providers are joined as part of this platform, the platform owner or owners have a powerful revenue vehicle for a new saleable service. Machine learning is a sub-capability of AI and can be used to learn and establish behavioural profiles, and then find anomalies that occur past the establishment of the baseline profiles.

This allows for transportation networks to be understood, monitored and have route changes, like completion times, identified and compensated for without requiring a user to intervene. ■

Artificial Intelligence and Machine Learning will be the core for providers creating new revenue platforms and providing new services to customers

Intermodal traffic – how to keep your IoT cool

Proponents of intermodal transport are looking to the Internet of Things (IoT) to bring additional benefits to using a combination of transport types for freight, says Annie Turner, editor of IoTNowTransport.com.

China's US$1.3 trillion One Belt One Road initiative envisions creating a mesh of infrastructures including roads, railways, telecommunications, energy pipelines and ports

The transport and logistics industry was quick to see the potential of new sensors and connectivity to track containers and their contents by monitoring location, temperature, light levels, pressure, doors being opened and other parameters, making the industry one of the most advanced in their use, according to *Deloitte University Press*.

According to figures from container shipping company, **Maersk Line**, in 2017, about 59% of claims against freight companies by their customers arise from malfunctioning reefer units [refrigeration containers], poor handling during off-power periods and human error in setting and maintaining temperatures. It says that IoT devices installed on about 270,000 refrigerated containers alerted it to more than 4,500 incorrect temperature settings in the space of six months. That included 200 severe cases that could have resulted in the loss of million dollars-worth of cargo, instead allowing it to fix the problems quickly.

So far, though, the tracking solutions have mostly been deployed in silos – dedicated systems for specific kinds of transport, according to Benoit Tournier, marketing director – Transportation & Mobile Solutions, **Sierra Wireless**. He thinks as pressure mounts to increase the level of intermodal transports, IoT solutions could be, "not the only trigger but a solution to shorten the time to ship goods from A to B ... without much time lost when moving from one kind of transport to another. IoT can be predictive and constantly adjust the expected time a container will arrive at a port, for instance. It will lower costs and mean smaller delays."

The push for intermodal traffic

Authorities in many parts of the world are keen to see more intermodal (also known as combined or multimodal) transport. The European Union (EU) is predicting an increase road freight transport of about 40% in Europe by 2030 and of over 80% by 2050. The EU has made getting more freight off the road a priority to:

- cut noise and pollution;
- reduce the number of accidents;
- alleviate congestion;
- combat climate change;
- ensure the free movement of goods across the continent; and
- maintain Europe's competitiveness.

China's US$1.3 trillion One Belt One Road initiative envisions creating a mesh of infrastructures including roads, railways, telecommunications, energy pipelines and ports. The aim is to improve economic interconnectivity and development across Eurasia, East Africa and more than 60 partner countries.

However, China's grand plan is still in its infancy while EU figures show that the proportion of freight travelling by road, rail and inland waterway has barely changed over the last decade. In 2015, road made up 75.8% of all freight transport, versus 76.3% in 2006, while waterways rose slightly, from 5.7 to 6.3% and rail declined, from 18 to 17.9%.

Intermodal's progress is slow in the US too. Although the road freight industry is suffering the longest period of tough operating conditions on record, the railways seem incapable of exploiting the opportunity.

Beyond immediate costs

Bert van Leeuwen, managing director, Aviation Research, **DVB Bank SE**, says, "If anything has to be added, it makes [transportation] more expensive and shipping is a marginal business...as well as the cost [of IoT technology], you've got problems with battery life and robustness – a lot of cargo suffers 'abuse' such as the salty environment aboard ships, and in handling at the ports."

There are 33 million dry containers and 2.7 million reefers, plus 552,000 tank containers in use worldwide, with reefers increasing at the fastest rate. Van Leeuwen says tank containers (tanktainers), designed for the intermodal transport of liquids, gases and powders, then reefer (refrigerated) containers are the most obvious places to start.

However, Sierra Wireless' Tournier thinks it's not just the cost of implementation and devices that is putting some shippers off using IoT. He explains, "We are not at the right level of concern yet with freight and logistics companies; they are not looking far enough ahead. They need to factor in device management to avoid manual intervention for software updates and function changes." ▶

He adds, "Containers last for 10 or 15 years, so you need to think about how you will manage the device over their lifecycle and how you will amortise the cost".

Greater regulation will be an important driver too: for example, as Sue Rutherford, VP of Marketing, **ORBCOMM** points out, "The US Food Safety Modernization Act requires traceability of cargo condition during the journey from 'farm to fork'."

Intermodal goes digital

As intermodal traffic increases, so will the number of opportunities for things to go wrong – the hand-off process is particularly ripe with possibilities. Will this shifting of responsibilities be further complicated by the number of technologies that will used for IoT, creating a highly complex situation on a massive scale?

Rutherford says, "IoT adoption for cargo visibility will draw on multiple communications networks – from satellite to cellular to LTE, LoRa, BLE and more ... our focus is more software and analytics centric, looking to continued development of robust cloud technology and open architecture that enables connectivity of multiple devices and sensors, and allows different participants to view a single 'version of the truth' on the same digital platform. The convergence of IoT with other emerging technologies such as blockchain could also unleash tremendous value by creating more transparency and simplicity in the movement of goods."

Tournier states, "These new categories of networks offer better coverage at much lower cost, which will push down the price of IoT solutions and change shippers' business models. They will be able to move from a capex to opex model, aligning their cost base to revenue from their customers."

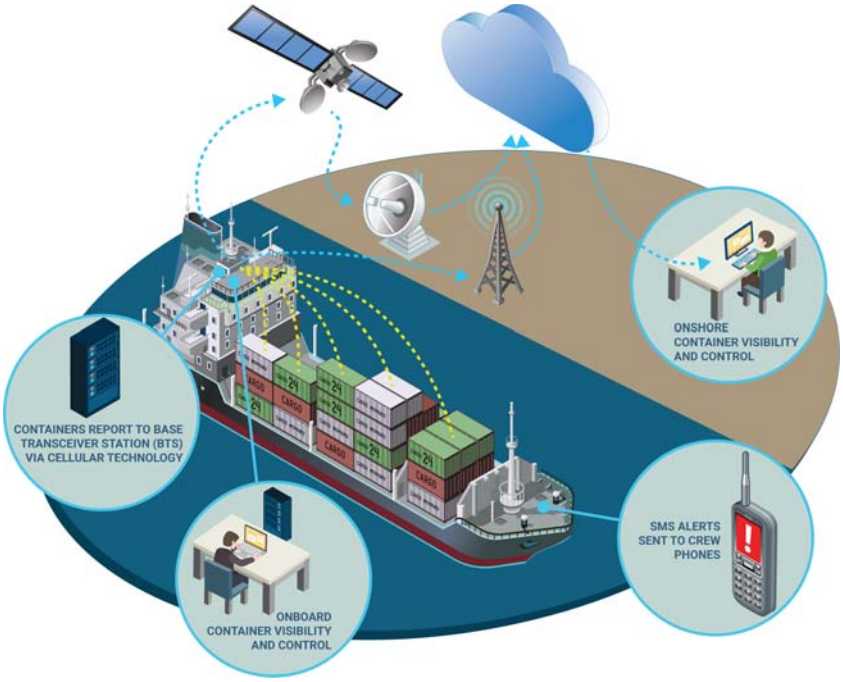
He also stressed the importance of IoT becoming more standardised to support interoperability not just between devices but between IoT platforms and cloud-based assets, "making it easy to get at data and have the time to enrich data" by pulling together information from different sources – such as the temperature inside a container and the weather forecast.

This is echoed by A.P. Moller-Maersk's announcement of a joint venture with **IBM** in January – subject to approvals – to provide a digital platform open to all players, including competitors. According to the company's executive vice president, chief commercial officer Vincent Clerc, the venture will be spun off into a separate entity to ensure its neutrality.

He added the platform will "enable easy access and sharing of data between supply chain parties as well as a space where participants can develop digital solutions for themselves and their customers. A network of networks, so to speak".

Clerc concludes, "the potential efficiency gains that a supply chain can reap from these applications are huge". He points out that the World Economic Forum estimates that if all countries improved border administration and transport and communication infrastructure to even half of global best practice levels, it could mean a $1 trillion increase in global exports. ■

Connected containers at sea



"These new categories of networks offer better coverage at much lower cost, which will push down the price of IoT solutions and change shippers'

The promise of multi-modal transport: Making it easier, safer and greener to navigate urban environments

In most cities, if you don't own a car, or just want to leave your car at home, you typically need to use more than one mode of transport to get around. You might, for example, start with a city bus or a rental bike, then transfer to the subway system, a train, or maybe a ride-sharing service to finish your journey.

Intermodal transport really only works when it's easy

This method of getting around, known as multi-modal transport, or mixed-mode commuting, makes use of public and private transit options, and can be an easier, more efficient way to navigate urban environments. Also, because multi-modal transport means fewer people drive single-occupancy vehicles, it has the added attraction of helping to reduce congestion, road traffic accidents, energy consumption, greenhouse gas emissions, and dependence on fossil fuel.

Multi-modal transport is gaining momentum, with support from a growing number of city and national governments. In Europe, for example, sustainable Intelligent Transport System (ITS) services are part of the European Commission's action plan and directive for mobility and transport. A legal framework adopted in 2010 aims to accelerate the deployment of "innovative transport technologies" across Europe, with the goal of establishing "interoperable and seamless ITS services." One result of this directive is that public-transit authorities now make some of their operating data, such as arrival and departure times, available for use in intermodal transport schemes.

Simplicity is key

Intermodal transport really only works when it's easy. If intermodal transport is really going to compete with private cars, it has to be at least as convenient and straightforward as driving. That means it has to be truly simple to plan an entire journey, from start to finish, whether it's on foot, by bike, or using some motorised form of public or shared transport. Additionally, the entire trip needs to be completed as quickly as possible. Doubling or even tripling commuting time, when compared to private cars or other traditional forms of transit, is not acceptable.

The power of real-time information

Working as a part of the AU-DACE consortium – a consortium supported by the French government tasked with developing complete, sustainable mobility systems – Sierra Wireless, the leading provider of fully integrated device-to-cloud solutions for the IoT, has been able to help define the telematics requirements for each mode of transport used by Zaleo, an innovative mobile app developed by AU-DACE. The app gathers ▶

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and transmits data on wait times and available seats for public transport, reports on the whereabouts and occupancy of pooled and shared vehicles and supplies other essential details.

As a gateway to personal mobility, Zaleo shows you the direct route or the best combination of routes, based on data from public transport, various car sharing and carpooling services, bike routes, and pedestrian walkways. It then adds information about the suggested routes, detailing the savings, in terms of money, time, and carbon emissions, for each option. A complementary insurance system, adapted to the mobility of individuals, provides support for journeys that use rental services and other modes of transport that benefit from such coverage.

To make this system work, a cloud platform must be fed all the necessary information for every mode of transport. Each vehicle involved in the scheme needs to be equipped with telematics technology that provides, among other things, real-time location data.

The Zaleo architecture draws on Sierra Wireless' many years of telematics experience with leading automotive manufacturers and car-rental companies and, as a result, uses the same secure, reliable techniques as vehicle safety systems and complex fleet management systems.

Everything Needed

Along with helping to define the technical specifications for telematics, Sierra Wireless can also supply all the technologies needed to implement them, including modules, SIM cards, cloud, and connectivity services required by private transport services, and the mobile gateways used by public transport to control operations. In fact, Sierra Wireless can provide everything necessary to enable a Zaleo-style app.

The Only End-to-End Platform

Sierra Wireless is the first to combine cloud, hardware, and managed connectivity services to support worldwide deployment of transit solutions. The offering includes embedded solutions, vehicle-area network (VAN) multi-network routers and gateways and cloud-connectivity services.

Embedded Solutions

Designed into the telematics solutions used by the various modes of transport involved in a door-to-door app, Sierra Wireless AirPrime® WP Series embedded modules use an integrated device-to-cloud architecture that enables quick development of a Linux-based product, and seamlessly sends valuable user and product data to the cloud. Offering an application processor running the open-source Legato platform, a GNSS receiver, and a cellular modem with an ultra-low power domain, WP modules reduce system complexity and speed time-to-market.

Vehicle Area Network - Mobile Networking Solution
Sierra Wireless offers a vehicle networking solution that uses highly reliable, high-capacity connections to support depot Wi-Fi and broadband cellular for multiple onboard systems to simplify deployment, management, and maintenance of advanced mobile networks on public transportation. The AirLink Networking platform includes a rugged cellular vehicle router such as the AirLink MG90 or MP70, the AirLink Mobility Manager, a mobile-network management system for advanced, real-time control of the entire fleet; and the AirLink Connection Manager (ACM) Mobile-Optimized VPN Server, a secure platform that provides advanced security for all connected devices.

Sierra Wireless Adaptive Connectivity

Through the Sierra Wireless connectivity series, telematics devices using Sierra embedded modules, or AirLink networking vehicle routers can be equipped with a Sierra Wireless SIM card that provides multi-operator coverage with global roaming. That can simplify the setup for a number of transport services, especially those that operate over a broad geographical area, by having just one connectivity agreement, one network integration, one management platform, and a single point of support, while having access to multiple networks throughout an operating region.

As municipal and regional governments focus on ways of making transport more environmentally friendly, more efficient, safer, and more secure, the increasing demand for apps and services that support intermodal transport will not slow down.

For more on the technology needed to develop a transportation app like Zaleo, read the whitepaper "The Promise of Multi-Modal Transport."
http://bit.ly/2Hd12TK ■

Sierra Wireless is the first to combine cloud, hardware, and managed connectivity services to support worldwide deployment of transit solutions

Alexander Sator:
Tipping point

Alexander Bufalino:
Energising IoT use cases

Robin Duke-Woolley:
Building blocks of IoT

First of its kind flat rate, plug and play IoT connectivity offering opens doors to new use cases in the automotive industry

In the rapidly evolving world of the Internet of Things (IoT), market disruption is accelerating. Game changing start-ups and business models are now beginning to emerge with offerings not even thought possible three years ago. And all this with the common goal of connecting the billions of devices that exist in every market sector, geography and innumerable different industrial and consumer use cases.

Theirs is a simple subscription offering, where one SIM fits all networks and at a price point that is hard to believe you've read it correctly.

The truth is though, that the cost and apparent complexity of connectivity has been a major hindrance in realising this vision. Until now.

Backed by one of the world's largest network operators, Deutsche Telekom, IoT Connectivity provider, 1NCE, has torn up the rule book and challenged the old-school, cost-heavy, overly-engineered connectivity models, prevalent up to this point.

Theirs is a simple subscription offering, where one SIM fits all networks and at a price point that is hard to believe you've read it correctly.

Awarded 'Best in Show' for their offering, 1NCE made their debut at Mobile World Congress, in Barcelona, with their revolutionary flat rate offer of 500MB for 10 years, across unlimited devices at a one-time cost of €10.

This is what every business looking for easy to deploy, cost-effective IoT connectivity has been waiting for. Are 1NCE the democratisers of ubiquitous IoT connectivity?

Market ready for change

Alexander Sator, founder and chief executive of 1NCE answers this in interview with us, "We believe that the market place is ready to change now. We're finally at the tipping point where billions of IoT devices need to be connected. A decade ago we saw the predictions of tens of billions of devices, but this has taken longer than expected to come to fruition.

"Access to cost-effective connectivity that is appropriate for individual IoT applications has been one of the barriers holding back the development of IoT into the multi-billion device mainstream. There are 50 billion machines waiting to be connected and for this to happen a game changer is needed in connectivity." Their offer, a first of its kind, may seem controversial and even appear to carry an element of risk at this point but 1NCE believes that this model will be the standard offering in the next decade. They just got there first.

1NCE'S partnership with Deutsche Telekom affords them the freedom, and provides the critical support, to develop a core network built on the latest technologies, enabling them to run this offer at such a minimal cost.

Plug and play

Sator states that his company's main objective is to make massively scalable IoT connectivity 'plug and play'. So straightforward that it takes the hassle out of comparing connectivity options, contracts and service level agreements. They offer one data plan with a one-off charge with the aim of letting enterprises get straight down to the business of making the IoT work for them.

"The value we provide is that, because we allow customers to calculate and control their connectivity costs with one simple agreement and payment, they can focus on developing their IoT solutions, not managing a complex web of different connectivity providers.

"We're a fire-and-forget offering, hire us and you're connected for the next ten years at a fixed price. We ▶

started with three key ideas: to make it simple, to make it plug and play and to design it for massive growth. With this tariff, we will make it as easy as possible for our customers to quickly implement new IoT solutions," explains Sator.

Of course, those that will benefit most are the manufacturers or OEMs, the one-size-fits-all tariff is a game-changer, it essentially levels the playing field and enables a whole range of completely new IoT use cases.

Robin Duke-Woolley, CEO IoT analyst house Beecham Research states in a recent IoT Connectivity report that, "The true building blocks of the IoT are the very large numbers of small datasets from an enormous range of things connected to an ever-wider variety of different applications and services. It is the connectivity for all these things that the IoT is actually built on and it is the connectivity that has so far not been in a form to fulfil the promise of the tens of billions of connected things so often predicted."

Technology-agnostic

1NCE's IoT connectivity network is technology agnostic, it offers NB-IoT, 2G, 3G and Cat-M connections. Included in the flat rate of €10, is the SIM and all subscription fees. Their SIM management platform allows for full control of the deployed SIMs and as an added bonus for OEMs there's a unique selling point of 'connectivity as a feature' – meaning that their customers are spared the trouble of choosing a connectivity partner and managing monthly payments. With the potential to deploy thousands of devices per application this is a very streamlined approach to IoT connectivity and an exciting prospect for organisations designing new products and services.

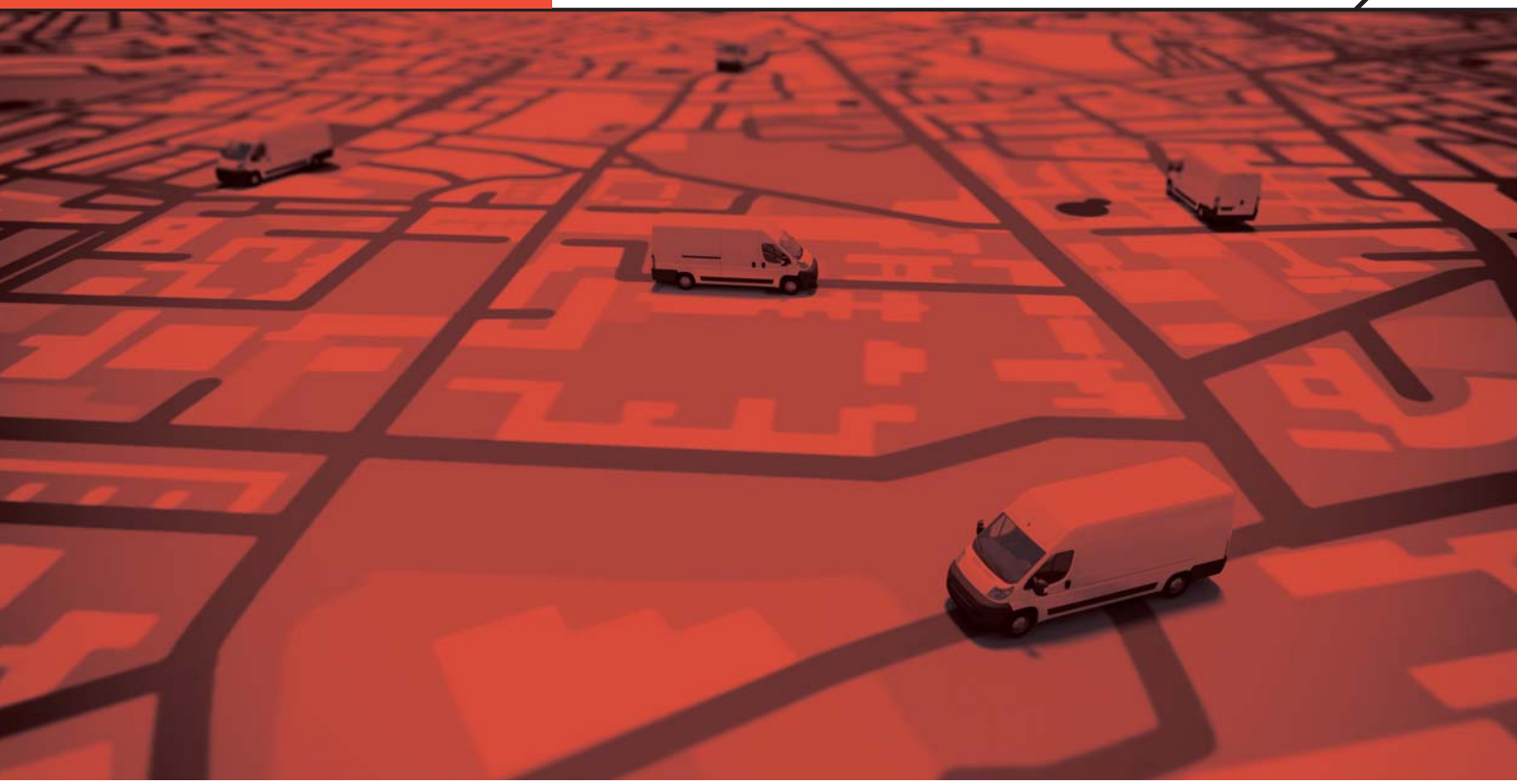
An example of the many 'things' that can transmit small datasets, meaning they only need narrowband connectivity to create new IoT services, are bicycles, smart parking spaces, street lights, machine tools, smart home equipment such as smart thermostats and of course the vast number of applications across the automotive and transport industries.

"We believe that a tier one quality, IoT-grade, low frills offering is the enablement element needed to energise existing IoT use cases and provide opportunities for further growth. 1NCE will enable many of these use cases that were previously unviable. We're taking a significant task off the list of IoT innovators, so they can devote more attention to the services they're offering," emphasises Alexander Bufalino, chief sales officer at 1NCE.

Steve Hoffenberg, director of IoT & Embedded Technology at VDC Research, the organisers of the Embeddy Awards that named 1NCE as Best in Show at Mobile World Congress, says they chose the 1NCE offering "for its potential to bring connectivity to a much broader range of IoT devices than was previously economically feasible".

"Our disruptive connectivity offering is not about spectacular use cases like autonomous vehicles or remote health control, but about tiny things driving fundamental change by operating through low bandwidth infrastructures," Bufalino concludes. ■

"We believe that a tier one quality, IoT-grade, low frills offering is the enablement element needed to energise existing IoT use cases and provide opportunities for further growth."



Moving transport and logistics beyond vehicle tracking

Examples of IoT being used to improve logistics and supply chain link back to the origins of the term 'internet of things'. Working for Proctor and Gamble, Kevin Ashton coined the phrase when trying to gain a better understanding of demand for lipstick by connecting supermarket shelves back to the supply chain. Tom Rebbeck of Analysys Mason reports.

Transport and logistics was one of the earliest use cases for cellular connected devices and, in many countries, remain the largest application areas. Suppliers initially targeted the market with IoT solutions focused on high-value assets, such as containers and the heavy goods vehicles that carried them, where the return on investment was easily demonstrable. The next stage of the market will be to move beyond simply tracking the location and state of the vehicles, to closer monitoring of the assets themselves.

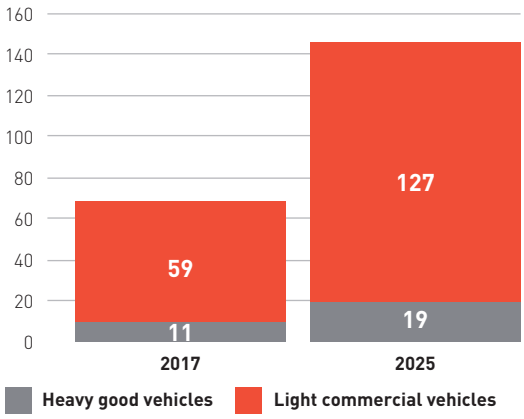
We expect strong growth in the fleet management category

Analysys Mason estimates the total number of connected commercial vehicles will increase from 70 million in 2017 to 146 million in 2025 (figure 1), with the number of connected light vehicles growing faster than the market for heavy goods vehicles. As the cost and complexity of fleet management solutions continue to decline, solutions will become increasingly attractive to managers of smaller commercial vehicles.

Growth rates in fleet management solutions reflect the development of the economy

In terms of value, the total value of fleet management solutions globally in 2025 will be around US$19 billion, up from around US$12 billion in 2017. The increase in value of the market (up 64%) will be slower than the number of connections (up 110%) due to price declines, the increasing popularity of lower cost solutions and the gradual shift in the market towards solutions for light commercial vehicles.

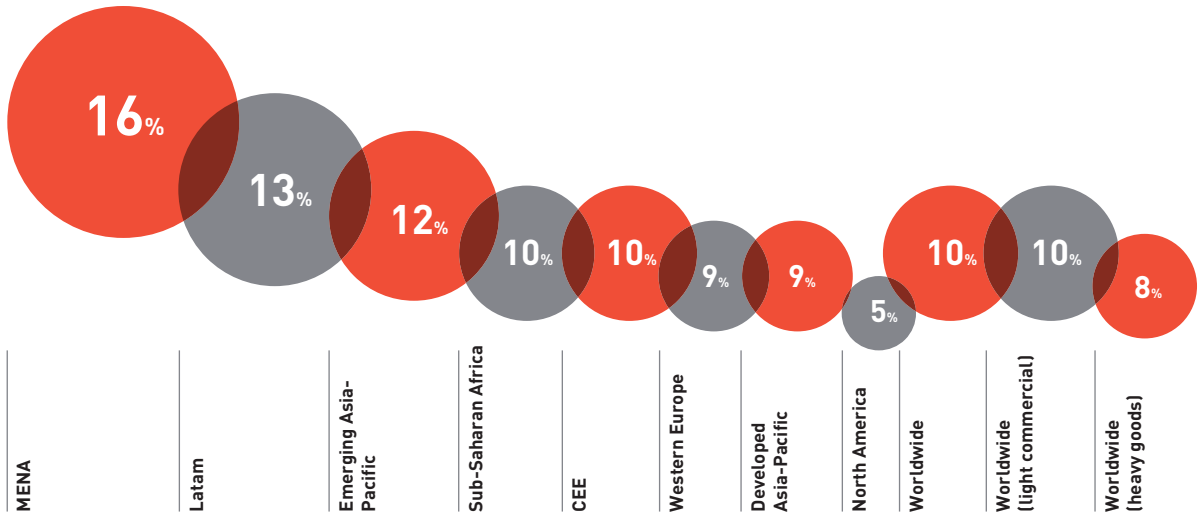
Figure 1: Total number of cellular connected vehicles, 2017 and 2025, worldwide (Millions)



[Source: Analysys Mason, 2018]

Growth rates in fleet management solutions reflect the development of the economy (figure 2). In low and middle-income countries, where penetration of fleet management solutions has historically been relatively low, growth rates will be highest. In high-income regions, growth rates will not be as high, but driven by the adoption of fleet management in light commercial vehicles, could approach 10%. North America, by far the most mature region for fleet management, is notable for its growth rate of 'only' 5%.▶

Figure 2: Growth rates by region, all fleet management, plus worldwide totals, CAGR 2017-2025



[Source: Analysys Mason, 2018]

Fleet management is the application to gain most attention from telecoms operators

For most aspects of IoT, telecoms operators have been relatively conservative and made few acquisitions. Fleet management however is one domain where operators have been willing to invest, and in the case of Verizon, spend substantial sums of money doing so (see examples in figure 3).

The main motivations for telecoms operators acquiring fleet management firms are:

- The acquisition of fleet management firms allows telecoms operators to take position in more of the value chain. Most fleet management solutions include a device, service, as well as connectivity revenue. Over the lifetime of a contract, connectivity revenue typically represents less than 20% of the total value.
- The market is relatively mature, limiting the risk. In buying fleet management companies, telecoms operators are not buying a start-up that needs nurturing but mature, established businesses. This may well fit well within the existing telecoms operator model, which is ill-suited to growing early-stage businesses.
- Most fleet management companies are more service than technology companies. While the offering is underpinned by technology, the service and support elements of fleet management are the crucial differentiators. As such, most fleet management companies are national, rather than global companies, and so fit with the footprint of telecoms operators.
- The fleet management sector is a mature, if fragmented, market. In most high-income markets, established companies have a strong position in the market. This means that it would be hard for new entrants, like telecoms operators, to enter the market organically. Acquisition is the surest means of gaining share.

The rewards for acquisition are clear. In its Q4 2017 results announcement, Verizon reported that its telematics business generated over US$230 million. Verizon also claims to be the largest fleet management company in the US; its 2018 revenue may well exceed US$1 billion.

While the logic of acquisition is clear, challenges remain for telecoms operators. Fleet management is significantly different from the core telecoms operation. The value chain is different, as are routes to market, sales structures, support processes and so on. Telecoms operators that want to play in the fleet management market need to have divisions that become fleet management companies – structures from the telecoms business cannot be forced on to what is a different business.

Figure 3: Selected acquisitions of fleet management companies by telecoms operators

Target	Acquiring operator	Date	Details
Ocean	Orange	2015	Acquisition of a French fleet management company. At the time of the deal, Orange claimed it would make it the largest fleet management company in France
MTData	Telstra	2017	Australian fleet management company that was founded in 2003.
Telogis	Verizon	2016	A venture-backed firm that had annual revenues of a reported US$100 million at the time of acquisition.
Fleetmatics	Verizon	2016	US$2.4 billion acquisition of a global fleet management company. The largest IoT related acquisition of any telecoms operator.
Movildata Internacional	Verizon	2018	An acquisition to support Verizon Telematics' growth in Southern Europe

[Source: Analysys Mason, 2018]

Logistics will move beyond tracking vehicles to monitoring goods

Fleet management and logistics were early adopters of IoT technology as the business case was relatively easy to prove and payback rapid. However, until now, IoT has mostly involved tracking the vehicle, and in some cases the container, but not the item being transported. This is probably going to change, especially as new connectivity technologies, such as LPWA, develop and further reduce the cost of connectivity and of the device. ■

The current status of the fleet management market in Russia and Eastern Europe

Fleet management (FM) is an ambiguous term used in reference to a wide range of solutions for different vehicle-related applications. Berg Insight's definition of a fleet management solution is a vehicle-based system that incorporates data logging, satellite positioning and data communications to a back office application.

On-board vehicle computers first emerged in the 1980s and were soon connected to various satellite and terrestrial wireless networks

The history of fleet management solutions goes back several decades, says Rickard Andersson of connected transport analysts, Berg Insight. On-board vehicle computers first emerged in the 1980s and were soon connected to various satellite and terrestrial wireless networks. Today, mobile networks can provide ubiquitous online connectivity in many regions at a reasonable cost and mobile computing technology delivers very high performance, as well as excellent usability. All of these components combined enable the delivery of vehicle management, transport management, driver management and mobile workforce management applications linking vehicles and enterprise IT systems.

For report details go to: **www.berginsight.com**

CIS & Eastern Europe

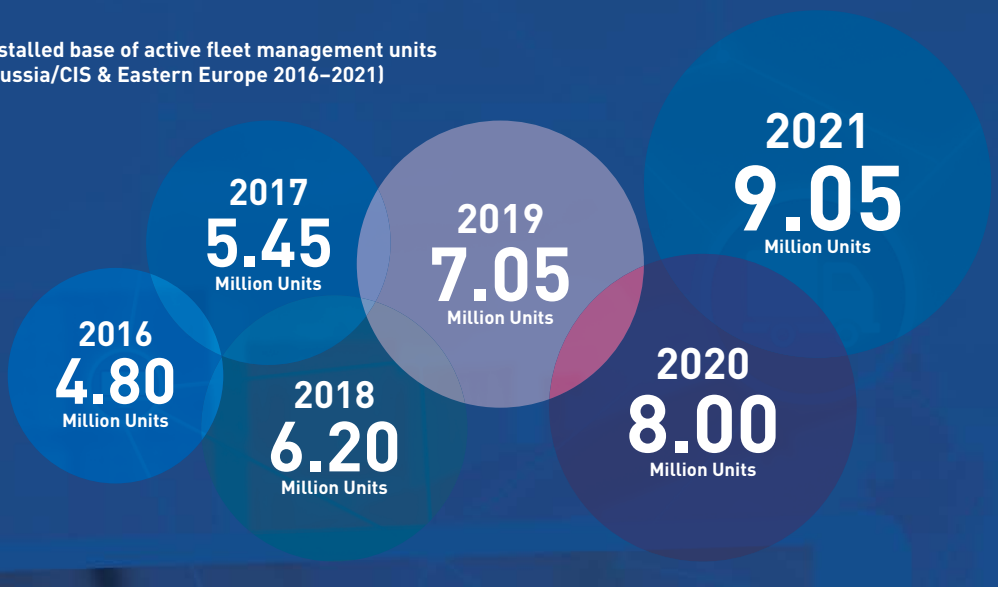
Commercial vehicle fleets play an essential role in the economy in the CIS and Eastern Europe, where several countries are part of important Pan-European transport corridors. The total of around 10 million heavy commercial vehicles in the region accounts for a major share of the inland transports. Motor vehicles are for example involved in about 70% of the total inland transportation in Russia.

In Europe, medium and heavy trucks account for over 75% of all inland transports, forming a ¤250 billion industry. Moreover, the greater part of the total 15 ▶

Latest FM mergers and acquisitions in the region

Company	Acquisition target	Date
Viasat Group	CMA Monitoring	April 2016
W.A.G. Payment Solutions	Princip	February 2017
SICK	Mobilisis (minority share)	May 2017
Viasat Group	ICOM (EuroGPS)	May 2017
Fleet Complete	Ecofleet	January 2018
Vodafone	Evotracking	February 2018

Installed base of active fleet management units (Russia/CIS & Eastern Europe 2016–2021)



million light commercial vehicles in the CIS and Eastern Europe are used by mobile workers and for activities such as distribution of goods and parcels.

Long-term growth of fleet management

Berg Insight is of the opinion that the fleet management industry is in a long-term growth phase. Key drivers in Eastern Europe and the CIS include cost reductions related to fuel savings and regulatory developments such as ERA-GLONASS and the Platon electronic toll collection system which increase the awareness of telematics.

The number of fleet management systems in active use in the region is forecast to grow at a compound annual growth rate of 13.5% from 4.8 million units at the end of 2016 to 9.1 million by 2021. The penetration rate in the total population of non-privately owned commercial vehicles is estimated to increase from 14.2% in 2016 to 24.2% in 2021. The Russian market accounts for a significant share of the region's total installed base and is expected to grow from 2.1 million active FM units at the end of 2016 to 3.5 million units by 2021.

Major players in FM

The leading FM solution providers in terms of installed base in the CIS and Eastern Europe include diverse players from a number of countries. Belarus-based Gurtam is the leading FM software provider, having surpassed the milestone of 500,000 vehicles under management in the region. Arvento Mobile Systems from Turkey and TechnoKom based in Russia are the first and second runners-up, followed by Turkish Mobiliz and the Russian players NIS (MTS), SCOUT and Navigator Group.

Additional top-15 players include Russia-based Omnicomm which has around 100,000 active FM units, as well as Infotech in Turkey, Fort Telecom and SpaceTeam in Russia, the European market leader TomTom Telematics, Princip in the Czech Republic, the major truck OEM Scania and Secret Control which is based in Hungary. With the exception of TomTom Telematics and Scania, the major international solution providers based in Western Europe, North America or South Africa are yet to reach the top-15 list for this region.

The road ahead

The expectations for the future fleet management market in Eastern Europe and the CIS include a gradual convergence with the developments in Western Europe. Eastern Europe is already tracking the most developed European markets closely in terms of system functionality and service models. Historically, the major Russian solution providers have mainly served large corporations with standalone software systems which are paid upfront and hosted in-house, whereas subscription services traditionally mainly have been adopted by SMBs. Cloud services based on recurring service fees have however now become a greater focus also for major enterprise fleets on the Russian market and the domestic FM solution providers are increasingly pushing for a transition towards SaaS-based models.

Another key trend on the European market is factory-fitment of original equipment maker (OEM) telematics, which is offered by most of the major truck manufacturers. The local manufacturers in Russia/CIS have, however, not yet fully embraced this development and the OEM fleet telematics activities remain comparably limited in the region. The local commercial vehicle manufacturers in the CIS market are also expected to gradually introduce proprietary telematics systems including vehicle tracking, remote diagnostics and other fleet management functionality, driven by regulatory developments and increasing competition from Western truck OEMs. ■

The author is
Rickard Andersson
of **Berg Insight**

The expectations for the future fleet management market in Eastern Europe and the CIS include a gradual convergence with the developments in Western Europe

For report details go to:
www.berginsight.com

For more information on the full 220-page report read more here:
http://www.berginsight.com/ShowReport.aspx?m_m=3&id=270

Bust the top myth of 5G adoption to lead the evolution of the IoT

As the world awaits the premiere of 5G, intelligent transportation systems (ITS), advanced fleet operations, smart logistics, and connected vehicles are just some of the anticipated life-changing applications. But, says Manish Watwani, Telit's VP of Global Product Marketing, do you really have to wait until 5G is ready to deliver these capabilities? (Hint: No, you don't).

IoT standards adopted by the 3GPP since Release 12 will take today's applications well into the 5G era

The global standard for connectivity will deliver fifth generation (5G) wireless broadband technology that impacts not only our smartphones, but also our homes, workplaces, cities, and vehicles. Many businesses believe that they should hold off connecting tens of billions of "things" on a global scale. Unfortunately, this also means that some organisations follow the fallacy that ubiquitous connectivity required to communicate with a massive volume of sensors cannot be accomplished effectively with the size and reach of current mobile communication capabilities.

Creating such an IoT-enabled network may be challenging, but it is as possible now as it will be in 5G. In 2016, the 3rd Generation Partnership Project (3GPP) introduced two complementary cellular low-power, wide-area (LPWA) IoT technologies in Release 13: enhanced machine-type communication (Cat M1) and narrowband IoT (Cat NB1). Both innovations looked to address long-standing requirements of small machine-type devices such as simplifying antenna design and enhancing coverage to link 15dB over existing LTE and 20dB over existing GPRS. Plus, power-saving operating modes should be improved to extend battery life for approximately 10 years while penetrating building infrastructure reliably.

Two years later, 3GPP's Release 13 is helping companies build products that are highly cost- and size-effective and suitable for large-scale rollouts. Plus, the features needed to keep pace with the evolution of IoT-driven applications are within reach.

Tap new revenue

Cellular LPWA standards delivered in 3GPP Releases 12 and 13 are already playing an integral role in the IoT. From connected vehicles to smart cities, businesses can open up unprecedented value and new revenue streams. Low-power and higher in-building penetration can enable new application types never thought possible before. For example, a parking meter in an underground parking structure can now remain reliable and reachable by the closest cellular base station. Parking service providers have a distinct opportunity to enhance customer experience and reap new revenues.

Another enabler of a new revenue stream is voice communications. The ability to quickly establish and sustain verbal communication is essential in transportation use cases such as vehicle emergency systems, bus stop surveillance, parking area monitoring, gated access control, and logistics trackers. However, this technology is a complex issue for narrowband connections.

Reliable and clear voice transmissions require substantial resources in terms of processing power for encoding and decoding as well as spectrum to transmit and receive. Whereas LTE Cat NB1 does not support voice connections, its counterpart (Cat M1) does, making ▶

Cat M1 the lowest-power wide-area standard to support it and bringing an endless range of new applications.

For example, a fleet driver's uniform embedded with a voice-supporting tracking device allows the driver to talk to first responders during an emergency, where no other form of communication is possible. Such a uniform is possible because low-power requirements for LTE Cat M1 enables light-battery power, while voice support is achieved through speakers and a microphone embedded in the garment. The standard for voice support in LTE is Voice over LTE (VoLTE).

As part of Release 13, 3GPP specified a radio interface optimised for machine-type traffic. This technology, Cat NB1, established a foundation for IoT connectivity by scaling down complexity, minimising battery consumption, deepening coverage for difficult and remote conditions, and increasing device density.

Cat NB1 is designed for infrequent and short messages between the device and the network, which addresses the needs of common applications and use cases for the IoT. However, this signal can be disrupted when jumping from one cell to another. On the road to 5G, 3GPP looks to address this concern for certain classes of solutions, devices, and innovations focused on an all-in 5G world by introducing cell reselection.

To ensure that connectivity between devices, business applications, and servers or other devices, organisations should consider crucial safeguards for secure and agile transmissions:

1. **Real-time subscription switching through remote provisioning:** Simplification of long-term maintenance and management allows the switching of preloaded profiles that are integrated with multiple network carriers, so the optimal cell profile is selected for the moment and application.
2. **Scaling of LPWA devices:** Enhanced LTE standards for Cat M1 and Cat NB1 enable devices such as sensor net nodes on roadways, parking structures, and others to achieve critical cost and size targets while easing device installation and manufacturing.
3. **Continuous security updates:** The IoT network should be continuously scanned for security risks and improved to tighten those gaps to comply with the global criteria set by mobile network operators.

Voice over LTE messaging

Borrowing from traditional internet connections, the expectation for voice over LTE (VoLTE) messaging is quite simple. Users dial the number of the intended digital destination, establish an IP connection, engage in conversation, and sustain the connection – even if there's absolute silence – until someone hangs up.

Businesses that gradually adopt VoLTE capabilities are positioned to realise the full promise of the IoT. Voice capabilities offer a natural and easy experience when receiving input and delivering information, especially when eyes and hands are too busy to enter and read prompts.

VoLTE is a fundamental requirement for maturing IoT adoption. To manage the speed, quality, volume, and signalling associated with VoLTE, companies should weigh their IoT strategies and technology investments based on three critical requirements:

Longevity: Choose devices, modules, and applications that have matching lifecycles, require minimal field support, and lower the total cost of ownership of the entire IoT network. Such proactive planning ensures that the proper API is available if a replacement is needed in the future.

"Design once, use anywhere" mindset: Support cellular technologies with a family form-factor approach. The single design enables organisations to address the needs of a variety of regional markets. The components of the IoT network are interchangeable because they all exhibit the same size and shape, pin-to-pin compatibility, and software interface.

Reliable radio-frequency performance: Employ advanced radio-frequency engineering, equipment, and process technology consistent with targets of lowering the power consumption and boosting wireless performance of existing devices to ensure undisrupted connectivity across the IoT network.

Deliver new IoT features

Mapping devices directly to data management systems and applications is time-consuming, tedious, and error-prone. Each device needs to be programmed individually to support anticipated capabilities such as data-driven analytics, automated action triggering, and two-way communication. The process can take as much as five minutes to install one device. Industrial users managing thousands of assets, for example, can end up dedicating a hundred hours to set up a new network of 1,000 devices.

3GPP is integrating multicasting standards and features. It provides a way to send the same information to specific devices and applications or across the entire network all at once. Multicasting minimises specification changes by supporting single cell point-to-multipoint coverage. By leveraging LTE broadcasting system architecture, enhancements to air interface improve radio efficiency and reduce information latency.

By combining multicasting with a data-centric IoT platforms, organisations can open up a central information pipeline to all legacy and modern devices and applications and tightly integrate them regardless of communication protocol. Companies can access a wide selection of drivers on demand and move data bidirectionally and simultaneously. More importantly, they can experiment with this new concept in a limited way now to prepare for a full-scale rollout when 5G is operational.

A lot of opportunity will come when 5G arrives. However, that is not a convincing argument to delay any new IoT advancements. Businesses will need these next few years to evolve their IoT capabilities with features laid out by 3GPP's Release 12 and 13, so they can pull the most significant benefit from their 5G investments quickly and without disruption. ■

"While over 70% of companies plan to have 5G use cases in production by 2021, businesses in manufacturing, energy and utilities, public transport and financial services are most likely to have theirs in production by 2020."

The Industry Impact of 5G, Ericsson, January 2018

Telit (AIM: TCM) has a portfolio of wireless connectivity modules, platforms, virtual cellular IoT operator, and professional services. To learn more on how to Accelerate LPWA Device Deployment request a Free Evaluation Kit: http://info.telit.com/lpwa-evaluation-kit

Accelerating OT and IT convergence for operational excellence

The major obstacle is the lack of standards that can be applied to streamline the access methods

Stefan Palm, business development manager at Moxa Europe, talks with Fredrik Stalbrand, senior analyst at Berg Insight, about Moxa's industrial IoT vision, security and 5G networks.

Fredrik Stalbrand: The convergence between operational technology (OT) and information technology (IT) has meant a significant change for industrial environments. What is Moxa's approach to bridging the gap between these two worlds?

Stefan Palm: Actually, it is a change for people in the IT environment too because both worlds are moving closer together. OT and IT experts have to leave their comfort zones as they are being confronted with the reality that has developed outside of their scope. For both kinds of experts it can be compared with starting to learn a new language. OT specialists are used to Fieldbus protocols that are often based on serial communication principles: yet they are not very familiar with systems in an enterprise environment that uses TCP/IP based protocols to efficiently transfer information over the Internet, store it in datacentres and manage it in a way that enables them to retrieve information through the visibility of a much bigger database.

This is the expertise and domain of IT people who are usually unaware of how the data from a single sensor finds its way into the enterprise world. As an expert in acquiring data in the field, converting it from one protocol to another and then transferring it securely and reliably, Moxa bridges this gap and makes the data available in a format that IT people are used to and can deal with. Moxa's core business is to build the foundation for successful Industrial IoT (IIoT) and Industry 4.0 implementations by connecting devices, including legacy devices, and making the data available and understandable for people in both worlds.

FS: In the Industrial IoT space, what do you see as the main challenges and how should they be addressed?

SP: IIoT is currently facing three major challenges:

1. Connecting devices in the field and making the data available and usable in private and public clouds to be utilized by OT and/or IT systems.
2. Making sure the acquired and transferred data is protected and will be available for the intended user only.
3. Assuring that the data transfer happens in a deterministic way and in real time to enable full control, even in critical situations.

A prerequisite to master the first challenge is devices that can forward the data acquired in the field at sensor level and translate it in a way that it can be understood by the big number-crunchers up in the cloud. The major obstacle is the lack of standards that can be applied to streamline the access methods. There are promising candidates like MQTT, Restful API or OPC-UA that have the potential and are widely accepted by the industry.

The second challenge is related to the field of cyber ▶

Stefan Palm, business development manager at Moxa Europe

Moxa has already adopted the IEC 62443 standard in a variety of our devices in order to provide the feature-set that is required to secure the system and the environment

security and the ability to protect the environment from attacks. IEC 62443 is a widely accepted guideline that may help in achieving this yet this requires the support of all members in the communication chain down to device level. However, this is just a start and needs further development to deal with specific requirements of different industry segments which may need variation.

Mastering the third challenge is extremely important to ensure data integrity. Time Sensitive Networking (TSN) addresses this issue and comprises a set of standards that can be grouped into three key categories, which are required for a complete real-time communication solution: time synchronisation, scheduling and traffic shaping, as well as selection of communication paths, redundancy and fault-tolerance.

FS: Can you provide an overview of your activities in the smart rail and intelligent transportation segments?

SP: Smart rail and intelligent transportation are additional sectors where Moxa is active. We are actively contributing to the IEC TC9 WG43 to define the next generation of Train Communication Network (TCN). The latest achievement is the release of the IEC 61375 that specifies the onboard communication and in particular the Train Control and Management System (TCMS). In cooperation with leading train manufactures like Alstom and Bombardier, Moxa was able to prove the interoperability of their devices. This makes us one of the leading manufacturers for network devices on board trains. Another initiative is the contribution to an effort called Safe4Rail under the umbrella of Shift2Rail, which is funded by the EU. Ultimately, the project provides recommendations for the standardisation and certification of next generation TCMS embedded platforms.

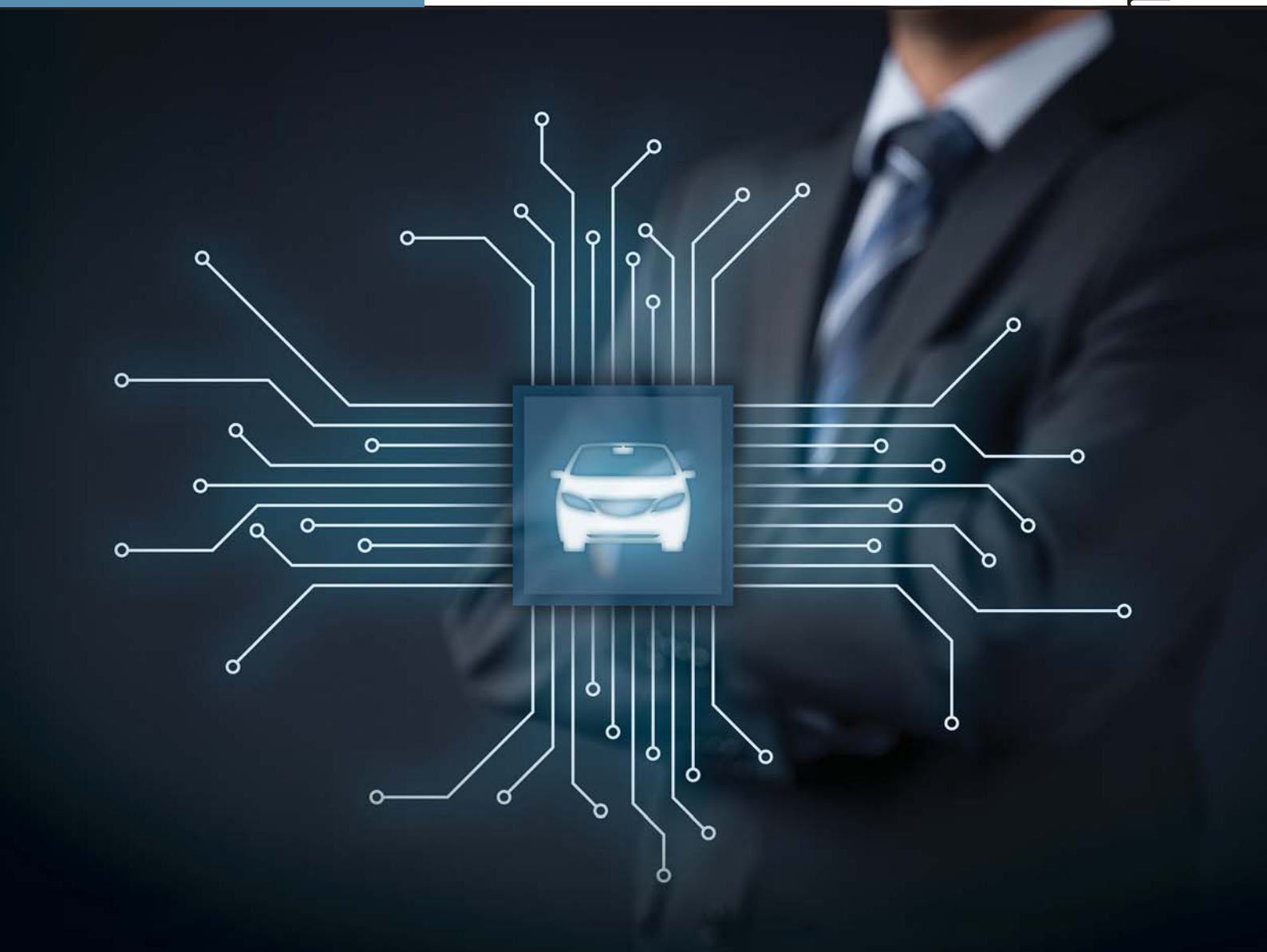
FS: Considering Moxa's focus on providing industrial networking solutions for the critical infrastructure sectors, how are you helping companies overcome the challenges they are facing around security?

SP: Moxa has already adopted the IEC 62443 standard in a variety of our devices in order to provide the feature set that is required to secure the system and the environment. The next step entails full integration into Moxa's real-time network management software toolset, MxView to allow customers to assess their current situation and suggest the necessary steps to achieve the desired security level. Moreover, Moxa is participating in various industrial consortia to keep the discussion going and shape requirements, so they will eventually become industry standards – and, of course to ensure constant security improvements to make our world a bit safer every day.

FS: Transportation and factory automation are often mentioned as industries expected to lead the adoption of 5G technologies. What is your expectation of 5G and its potential impact in these markets?

SP: 5G will change the communication infrastructure significantly as, for the first time, a wireless cellular technology will offer data transfer speeds as high as 20 gigabits per second, which is up to 10 times higher than the current 4G networks. This is a considerable performance boost and will allow the deployment of cellular networks in places where the bandwidth requirements cannot be fulfilled today.

There will be clear savings too, especially with regard to cabling as this will be no longer required. Moreover, installation and maintenance will become much easier and less costly. So, traditional wired Ethernet or Wi-Fi networks will migrate to wireless cellular technologies based on 5G. It will also enable real-time applications based on TSN over telephone infrastructures, so we are expecting a shift towards this kind of network set-up. ■



Embedded IoT solutions for transportation improves safety and service efficiency

Our offering for the transportation sector is made up of fanless embedded systems with unique designs for a range of transport industry applications

Fredrik Stalbrand: Can you give us a brief introduction to Advantech and your activities in the IoT market?

Jeroen Baerents: Advantech is a leader in providing trusted, innovative embedded platforms and services. We offer customer-centric design services and embedded boards and systems with global logistics support. Today, Advantech has operations throughout 23 countries and works with customers across a broad range of vertical markets including manufacturing, transportation, energy, retail and healthcare.

To address the growing market for IoT applications, Advantech has developed a series of integrated IoT solutions and services that expands the IoT value chain and ecosystem. We cooperate closely with partners to help provide complete solutions for a wide array of applications.

FS: The transportation industry places high demands on ruggedisation, expansion flexibility and communication support. Can you tell us about Advantech's hardware offerings and your efforts in meeting these requirements?

JB: Our offering for the transportation sector is made up of fanless embedded systems with unique designs for a range of transport industry applications. In-vehicle applications require strong vibration resistance as well as wide temperature and low power designs. Also, in railway applications, the vibration standard is very strict and requires EN-50155 and EN-50121 certification and M12 connectors to enhance and secure railway ▶

We have had many projects around Europe where we have rolled out both traditional fixed surveillance solutions and on-board surveillance solutions specifically for in-vehicle applications

operations. Wireless communications and security management are vital for both segments to connect to back-end systems.

To serve ruggedised environments in transportation applications, Advantech provides high computing and certified embedded systems that feature high extension capability for communication interfaces, wireless 3G/LTE and GPS communication support and wide operating temperature support. Our hardware offering also comprises a flexible second layer, which allows customers to add additional slots to connect with several external devices. With flexible and modular hardware design capability, we can efficiently meet customers' functional requirements and time-to-market.

FS: What type of applications does Advantech's hardware offerings enable in the transportation industry and what are the impacts for end-users?

JB: With our foundation in high-quality, high-performance computing platforms, we are able to serve a wide variety of segments in the market for intelligent transportation systems. Advantech works with system integrators, distributors and OEMs (original equipment makers) to enable applications such as fleet management, mobile video surveillance, passenger information, infotainment and traffic surveillance.

Our in-vehicle computers are, for example, used extensively in on-board surveillance and safety monitoring applications in public transport services. These solutions play a vital role in ensuring safety of the services and increase the attractiveness of public transport for travellers. From the perspective of the public transport operators, the ability to track and monitor assets remotely is an important requirement for cutting losses, improving efficiency and streamlining workflow.

FS: What trends do you see in the market for intelligent transportation systems?

JB: More and more computing solutions are required in all fields of transportation. Travellers increasingly demand better information and improved experiences from transport providers. Infotainment and on-board Wi-Fi are two applications that we see gaining traction right now. With undisrupted wireless access to the internet, passengers can use the journey time for work or pleasure, which is especially attractive for longer routes.

Additionally, transport providers can utilise this platform as a means of new revenue generation by providing contents from related cooperating content providers. Fleet operators are also increasingly investing in fleet management solutions that enable predictive maintenance and tracking to ensure safe and efficient operations.

FS: Intelligent transportation systems in public transport often require integration between different subsystems. What is Advantech's approach to partnering and what types of companies do you partner with?

JB: Advantech collaborates with professional ecosystem partners to provide the building blocks required for delivering integrated and innovative solutions to the market. We work closely with our partners to ensure compatibility and reliability of our combined solutions in order to help customers reduce integration efforts, time-to-market and related costs. For example, we partner with leading manufacturers of camera solutions, providers of video management systems and content management solutions as well as data analytics companies. We continuously look for interesting partners to complete our offering.

FS: Can you provide some examples of cities where your solutions have been implemented? What types of applications have been deployed?

JB: We have had many projects around Europe where we have rolled out both traditional fixed surveillance solutions and on-board surveillance solutions specifically for in-vehicle applications. When we focus on transportation projects, we see a growing need to monitor and optimise crowd flow and record video footage of ongoing events.

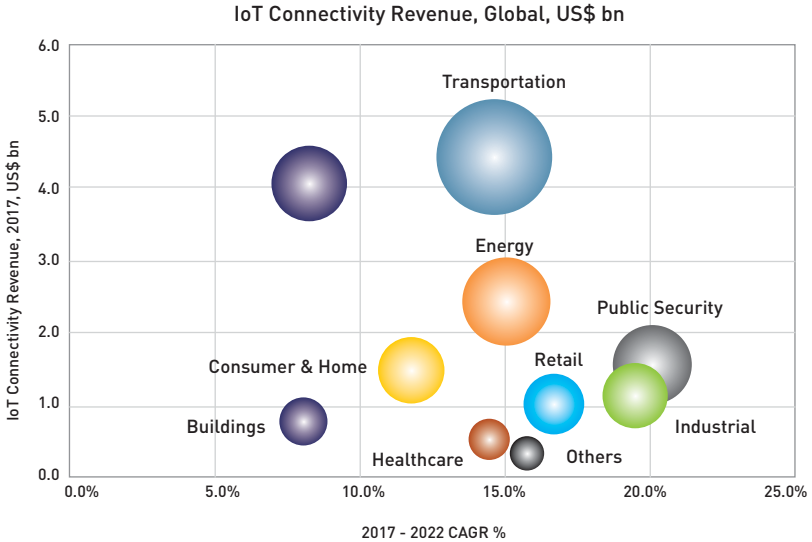
With this setup, drivers can see the current situation of passengers or assets located at different parts of the vehicle and respond quickly to disputes or incidents. Most importantly, evidence can be gathered from recorded footage which assists business owners or authorities to arrive at an appropriate action or decision.

Jeroen Baerents, European Business Development manager, Advantech

Choosing the right IoT platform for smart transportation

The transportation sector is most ready for smart transformation

The transportation sector, through traditional Machine-to-Machine (M2M) applications such as tracking/tracing and remote monitoring, is the most mature M2M/Internet of Things (IoT) segment. Since Beecham Research began its M2M research journey, the transportation sector has always been the most dominant segment. The ability to find assets, to track them as part of a logistical operation or even to just monitor where people or equipment, is a fundamental and widespread motivation to embrace IoT technologies. As illustrated by Figure 1, the transportation sector is by far the largest segment compared to others such as Energy and Public Security.



The number of mobile assets being tracked worldwide at end 2017 was in the region of 50 million units of which over 90% were vehicles, followed by trailers, containers, personal trackers and a long tail of others. Yet the total addressable market for mobile assets is larger. About 1 billion vehicles worldwide and about 10 billion pallets, the wealth of insights that can be generated for new services and applications is immense. To reach this potential, choosing the right IoT platform to support this value creation is crucial.

The platform market is complex and continuously evolving

Choosing the right IoT platform for your needs is an important starting point in your IoT solution journey. ▶

However, with so many platforms now on the market – we know of over 450 and still growing quickly – it is a highly confusing starting point. We define 4 layers in a platform; Connectivity Management, Device Management, Data Management & Analytics, and Application Enablement layers. Together, each layer connects the things to the network and abstract applications from the things to enable the development of services. In short, IoT platforms present different areas of specialisation and levels of sophistication such that the 'perfect' platform for all requirements does not exist. For this reason, we feel it is essential to evaluate the market offerings against your unique needs, in the context of your business operations and goals. Traditional platform ranking systems, reliant on an overall scoring process, are unable to take this level of detail into consideration.

Introducing Beecham Research's IoT Pilot Tool

Uniquely, Beecham Research's IoT Pilot is the first independent analyst driven tool able to critically assess the market landscape for you in this way. Narrowing your field of options to a manageable level allows you to commence a deeper, more valuable dialogue with the most appropriate platforms for your business much more quickly. IoT Pilot is designed to help get you started in evaluating the IoT platform landscape. It is designed to help you discover those platforms that best match your needs, so you can then focus on a smaller list to investigate further. This free online tool is the first step in your knowledge creation and selection journey.

Narrowing your field of options to a manageable level allows you to commence a deeper, more valuable dialogue with the most appropriate platforms for your business much more quickly

Conclusion

Beecham Research has been researching IoT platforms for a decade. To make a final selection of the most appropriate platform for your needs may require you to get answers to a set of up to 100 unique questions. You do not want to be asking all those questions to every platform provider you find. You want to shorten the list so you can then focus on that depth with just a few. Uniquely, this is what IoT Pilot enables you to do. It is here to help give you the confidence and market clarity to accelerate your platform selection and steer your IoT solution journey. Try it out online at:

www.iotglobalnetwork.com/iotpilot

Transport Research Arena (TRA 2018)

Vienna, Austria
16-19 April 2018
https://www.traconference.eu/?

Car HMi USA 2018 – UX Redefined

Detroit, USA
23-24 April 2018
http://car-hmi-usa.com

Telematics Insurance North America

Chicago, USA
25-26 April 2018
http://www.connected-vehicles-insurance-iot.com/program/

Smart Cities Expo

Toronto, Canada
7-8 May 2018
http://iotnowtransport.com/2018/02/27/66689-smart-cities-expo/

XPONENTIAL 2018

Colorado, Denver
30 April 2018
https://www.xponential.org/xponential2018/public/enter.aspx

Artificial Intelligence in Automotive

Silicon Valley, USA
17-18 May 2018
http://events.marketsandmarkets.com/Artificial-Intelligence-in-Automotive

Connected Cars Europe, Forum Europe

Brussels
17 May 2018
http://www.eu-ems.com/summary.asp?event_id=4357&page_id=9446

Internet of Things World

Santa Clara, USA
14-17 May 2018
https://tmt.knect365.com/iot-world/

Connected and Autonomous Vehicles

Santa Clara, USA
14-17 May 2018
https://tmt.knect365.com/connected-vehicles/

Mobile 360

The Hague, Netherlands
30-31 May 2018
https://www.mobile360series.com

Digital Automated Congress

Shanghai, China
5-6 June 2018
http://www.szwgroup.com/DAC/about.aspx

TU Auto

Detroit, USA
6-7 June 2018
https://automotive.knect365.com/tu-auto-detroit/

Autonomous Machines World 2018

Berlin, Germany
25-26 June 2018
http://autonomous-systems.tech

Car HMi Europe, we.CONECT

Berlin, Germany
27-29 June 2018
https://car-hmi.com

Con Car Expo

Berlin, Germany
27-28 June 2018
https://www.concarexpo.com/en/

ITS World Congress 2018

Copenhagen, Denmark
17-21 Sept 2018
http://www.itsworldcongress.com/

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Contact us for more information about our M2M/IoT market research or to arrange a meeting.

We cover in-depth all the areas illustrated below:

mHealth | Smart Cities | Connected Cars | Retail Applications | Smart Homes | Wearables & Consumer Electronics

Smart Grids | Industrial M2M | Fleet Management | M2M & IoT Strategies | Horizontal M2M & IoT Solutions | M2M Forecast Database

Berg Insight - 13 years of leading M2M/IoT market research

Based in Sweden, we have been specialising in all major M2M/IoT verticals such as fleet management, car telematics, smart metering, smart homes, mHealth and industrial M2M since 2004. Our vision is to be the most valuable source of intelligence for our customers. Berg Insight can offer numerous market reports, detailed market forecast databases and advisory services. We provide custom research tailored to your requirements including focused research papers, business case analysis, go-to-market strategies and bespoke market forecasting.

Our clients include many of the world's largest mobile operators, vehicle OEMs, fleet management solution providers, wireless device vendors, content providers, investment firms and venture capitalists, IT companies, technology start-ups and specialist consultants. To date we have provided analytical services to 850 clients in 70 countries on six continents.

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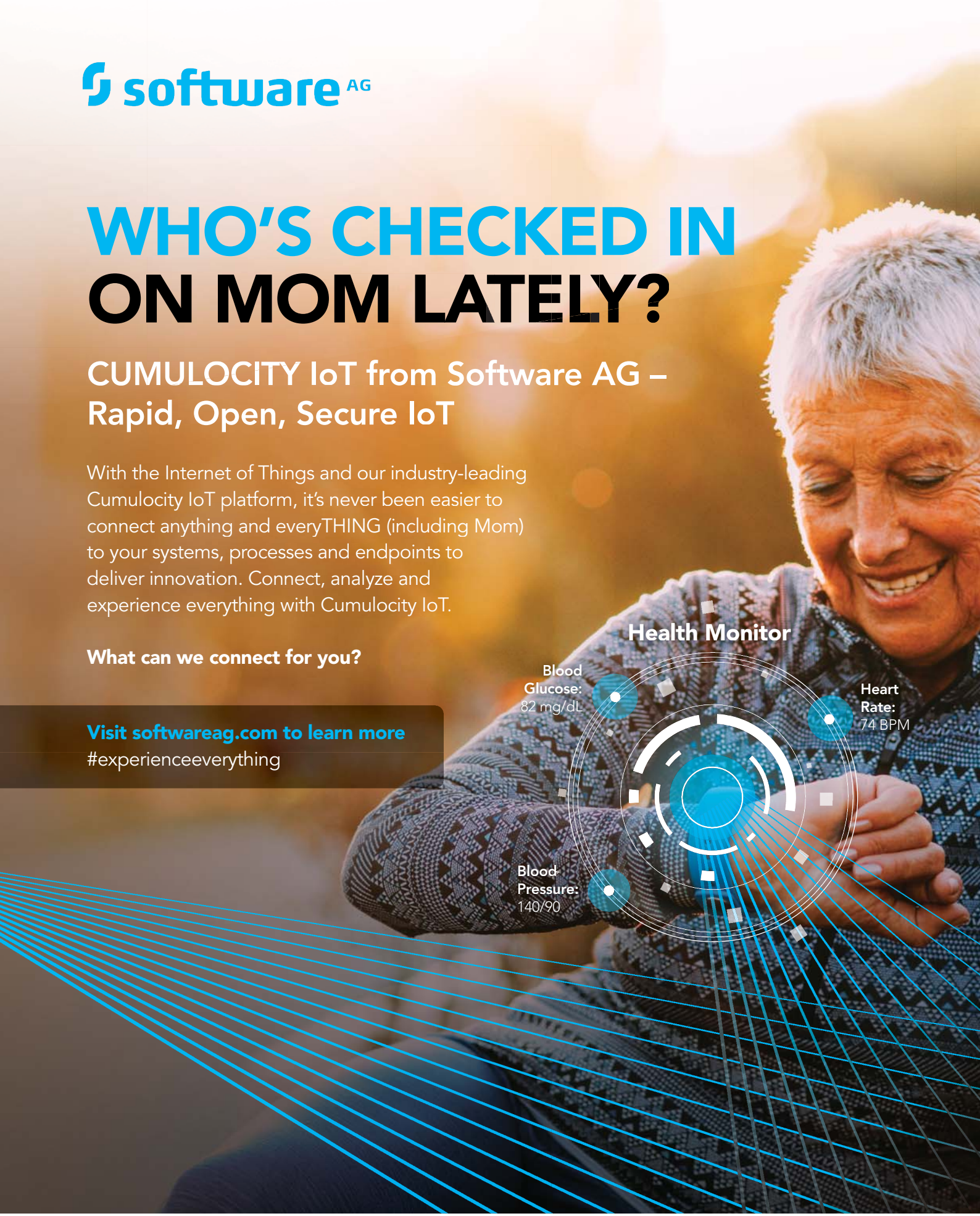

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