



# "Everything that can be automated will be automated."

The world around us is changing, fast. Telematics is taking hold and transforming how we work, how we communicate, how we live. Industries are being transformed, ways of working are being reinvented, and the Internet of Things ensures that we are connected to everything and everyone around us – anytime and anywhere.

Adapting to these changes is crucial as it paves the way for disruptive companies such as Uber, Netflix and WhatsApp.

But it also paves the way for new opportunities within the logistics sector. Telematics offers you the opportunity to innovate in ways you could never have imagined.

At IMT we welcome these developments. With this magazine we would like to guide you through these exciting times. A 360-degree view of what is happening in the field and what telematics will mean to work as you know it. Telematics is taking over.

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"EVENTUALLY EVERYTHING CONNECTS - PEOPLE, IDEAS, OBJECTS. THE QUALITY OF THE CONNECTIONS IS THE KEY TO QUALITY PER SE." CHARLES EAMES

Peter Hinssen is an internationally renowned technology entrepreneur and author of the book 'The day after tomorrow', a book about how to survive in times of radical innovation. Peter is founder of nexxworks and one of the most sought-after thought leaders on radical innovation, leadership and the impact of all things digital on society and business.

We asked him about his vision on the rise of telematics and how this will affect our life and our business. These are truly exciting times. We are on the threshold of the 'Internet of Things' (IoT) where all devices become intelligent, connected and communicative. Cars, washing machines, street lights, televisions, glasses, desks, door locks, thermostats, kitchen appliances, water pipes, clothes, food packages: name any device you can think of; one day they will all probably start seeing, hearing and talking.

When I think about the Day After Tomorrow of the Internet of Things, I always think of Autodesk Chief Pollutant Mickey McManus, who is one of the smartest people I know. He believes that the IoT is 'just' a part of an ultra-complex and highly organic trinity that will have a massive impact on the way we work and live:

- 1. the Internet of Things;
- 2. digital manufacturing; and
- 3. machine learning.

#### TRILLIONS OF CONNECTED THINGS

Mickey believes that the number of intelligent connected devices in the IoT will completely shift the scale of 'things' to a level that is unprecedented in human history. Today we're used to millions and billions. There are just under 10 billion people in the world today, and we've even built organizations that employ more than a million people. But it won't be long now before the boundless complexity and scale of the IoT will open up a world of trillions.

The only way we will be able to manage that scale, according to McManus, is by copying nature. Nature has been running

massive mature, ultra-complex, resilient information systems for (ironically) billions of years. They have the most effective memory, storage and communication systems for handling this scale of trillions. Just to give one small example: our human body has approximately 37 trillion cells that seem to be working together pretty well (most of the time). Nature can teach us how to design an ecology of things that can handle trillions.

#### DIGITAL MANUFACTURING – IF YOU CAN THINK IT, YOU CAN MAKE IT

The advent of fast (we're not completely there yet) and efficient 3D printing will allow us to create objects in ways that were unheard of before. It allows us to transform atoms into bits. Basically, we're pretty close to the point where we will be able to materialize what we think.

Just like word processing revolutionized our offices, and laser printers enabled us to unleash our own creativity onto the world, we now have the possibility to build anything we like with 3D printers. We can print retainers, organs, DNA strands, even large structures like bridges and buildings. It allows us to completely rethink supply chains in which, instead of shipping products, we can ship materials that can be stored and transported a lot more efficiently.

This collision between the IoT world of trillions and digital manufacturing will have a huge impact. We'll be able to manufacture whatever we want ... and then, in the next phase, we'll wake them up: they will become connected and smarter.

#### **MACHINE LEARNING & THINGS WAKING UP**

That's where machine learning comes in. State-of-the-art processors like those of Qualcomm mimic the human brain and nervous system: they make machine learning and deep learning possible in all sorts of small devices and objects. They enable devices to have embedded cognition driven by brain-inspired computing which basically means that IoT devices will all have tiny little brains connected to one another into one big brain. Qualcomm is embedding these neural processing chips into 3D-printed robotic assemblies that could dynamically detect patterns and shapes.

#### "CONTAINERS CAN BE SHIPPED IN A MORE SECURE MANNER AND WOULD BE ABLE TO MONITOR THEIR CONTEXT TO BETTER RESPOND TO ITS CONTENT."

This trifecta of trillions of IoT devices, digital manufacturing and machine learning is lifting digitization to a whole new level. Mickey believes that "Once things get connected, and wake up, we will all live in this sea of information. Instead of having information that lives 'inside' computers, we will now have us living 'in' a sea of information all around us."

#### **INDUSTRY 4.0**

This combination of the IoT, digital manufacturing and machine learning will usher us into the age of the Fourth Industrial Revolution. Surprisingly, a big part of the 'Industry 4.0' discourse did not originate in Silicon Valley. Instead, it emerged in Berlin. That's because the German economy has been built on manufacturing things: cars, toys, turbines, trains, power plants, high-end power tools etc. And if the world of 'manufacturing' is going to be disrupted, the Germans understood that they had better come up with a new strategy.

Industry 4.0 could digitize the entire manufacturing sector, which would be driven by four disruptions:

- the spectacular rise in computing power and connectivity;
- 2. the emergence of analytics and big data capabilities;
- 3. new forms of human-machine interaction, such as augmented reality; and
- 4. breakthroughs in transferring digital instructions to the physical world, such as advanced robotics and 3D printing.

Bits to atoms, in other words.

While Industry 3.0 had a clear focus on the automation of single machines and processes, Industry 4.0 is about the end-to-end digitization of all physical assets and the integration of all partners in the value chain into a vast digital ecosystem. It's what happens when manufacturing meets the era of the network, where computers and automation come together in entirely new ways. Robotics will be connected remotely to computer systems equipped with machine-learning algorithms that can teach and control the robotics with very little input from human operators.

The benefits could be vast and will go far beyond the manufacturing industry alone. In hazardous working environments, for example, the health and safety of human workers could be improved dramatically. Supply chains could be more efficiently controlled when data is available at every level of the manufacturing and delivery process. For instance, containers can be shipped in a more secure manner and they would be able to monitor their context (the temperature, the stability, the location...) to better respond to its content. Retailers could offer a completely different shopping experience like the cashierless Amazon Go shops or Alibaba's Hema. Farmers could use it to grow their crops better and monitor their cattle in a more efficient manner. Computer controls could produce much more reliable and consistent productivity and output. And the results for many businesses could be increased revenues, market share and profits.

Personally, I can't wait for the world of trillions to arrive.

### Order your free copy of The day after tomorrow

Read more about 'telematics taking over' in 'The day after tomorrow'. In this book, Peter Hinssen focuses on business models, the organisational culture, the talent, the mindset and the technology we should tap into in order to maximise our chances for survival in the 'Day After Tomorrow'. It will shift your perspective on your future, on the future of your company and even that of your grandchildren.

Order your free copy at hinssen.intermodaltelematics.com Use the promocode 'FREE BOOK' and we'll send you the book shortly (available while stocks last, terms and conditions IMT apply).



# A few things you need to know about the Internet of Things

Next year, there will probably be 26 billion devices connected to the internet worldwide. And we're not only talking about computers or phones, but also about TVs, lights, toothbrushes and smoke detectors. The whole thing is referred to as 'the Internet of Things' (IoT). It is changing the way we live, think and work. This is something to take into account. That's why we'd like to explain a few things for you.

#### WHERE THE WIRELESS THINGS ARE - AND WHY MOST IOT SMART DEVICES AREN'T IN YOUR HOME OR PHONE - THEY ARE IN FACTORIES, BUSINESSES AND HEALTHCARE.

Why? Because smart objects give these major industries the vital data they need to track inventory, manage machines, increase efficiency, save costs and even save lives. By 2025 the total global worth of IoT technology could be as much as \$6.2 trillion. Most of that value stems from devices in healthcare (\$2.5 trillion) and manufacturing (\$2.3 trillion).

#### 40.2% **BUSINESS**/ 30.3% MANUFACTURING **HEALTHCARE** Real time analytics Portable health of supply chains and 8.3% equipment, robotic monitoring, electronic machinery. RETAIL recordkeeping, pharmaceutical Inventory tracking, safeguards. smartphone purchasing, anonymous analytics of consumer choices. | ^ . . . . • • . . 00000

7.7% SECURITY

Biometric and facial recognition locks, remote sensors.



#### A few facts and figures about the Internet of Things that will blow your mind



**50B ASSETS** 

by 2020

RILLION

market value

333% GROWTH

of IoT enterprise

deployment since 2012

**OF C-LEVEL EXECS** 

new revenue from

believe IoT will unlock

existing products/services

30%

in the next decade

80 BILLION connected devices in 2025



**300 BILLION** global value of the sharing economy



**163 ZETABYTES** of data in 2025



96% OF SENIOR

business leaders plan to use IoT in the next 3 years



40% OF ALL DATA



generated by 2020 will come from connected sensors

# "It is not the strongest or the most intelligent who will survive It is the one that is most adaptable to change."

- Charles Darwin -



# Telematics S Tankwell

"Data on logistics are valuable as they help to maximise the advantages of low weight and excellent thermal insulation of the Tankwell tank containers."

Created in 2012 and located the north-west of the Netherlands, Tankwell designs and manufactures lightweight tank containers for the transportation of liquids: the innovative, patented composite tanks allow a weight reduction of 1500 kg. Since the first tank left the plant four years ago, more than 400 of the world's lightest swap body tank containers are in operation.

'Not only do the tanks allow a weight reduction of 40%, they also improve thermal insulation by 30%. When the tanks are used to their full capacity, it is possible to reduce logistic costs by 5 to 10% and CO2 emissions per cubic meter of transported product by 5 to 10%.

From the outset, Tankwell tank containers have been equipped with IMT thermometers, the WT17-Ex. Especially the logging of temperature over time helps to better understand what happens to the tank containers and their loads. The data helps to improve the design of the Tankwell products. For example, information on cooling down of the product inside the tank helps to find out what the positive effects of improved insulation are.

Moreover, the possibilities offered by telematics are important to our customers: data on logistics are valuable as they help to maximise the advantages of low weight and excellent thermal insulation of the Tankwell tank containers. It allows the optimization and control of the logistic chains. It can for instance support the decision to exclude a cooling or heating step during transport when composite tanks with improved insulation are used.

Therefore, all Tankwell tanks are prepared for the installation of a CLT-unit of IMT, the Communication and Location Terminal that plays a central role in the wireless data transfer from the WT17-Ex sensor to the IMT platform. In this way, the products can be easily transformed into Tankwell Lightweight Smart tank containers. Lightweight tank containers and telematics go hand-in-hand to achieve efficient and sustainable logistics.'

Casper Willems, Managing Director Tankwell



# Telematics are taking over

Everything is being digitalised. And because of the many benefits, we would rather see that happen sooner than later. Nonetheless, in the liquid bulk transport, it was mainly 'later'; the industry was certainly not at the forefront of digitisation. And that was precisely the reason for establishing Intermodal Telematics BV in Breda. We talk with Managing Director & Founder Dethmer Drenth, Director Operations Frits Huijgen and Sales Director Bernard Heylen about the role of their company in the digital transition of liquid bulk transport of gas, chemicals and food.

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Managing Director & Founder Dethmer Drenth, Director Operations Frits Huijgen and Sales Director Bernard Heylen

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#### "IF I ORDER SOMETHING WORTH TEN EUROS IN A WEBSHOP, I RECEIVE A NEAT TRACK & TRACE CODE WITH WHICH I CAN FOLLOW MY ORDER CLOSELY. BUT STAKEHOLDERS OF A TANK CONTAINER WITH AN ENORMOUSLY HIGH VALUE IN ASSET AND CARGO USED TO HAVE NO IDEA WHERE IT WAS."

Dethmer: 'If I order something worth ten euros in a webshop, I receive a neat track & trace code with which I can follow my order closely. But stakeholders of a tank container with an enormously high value in asset and cargo used to have no idea where it was. I found that so striking that in 2013 I decided to start IMT. Bernard was involved from the start. We started with location determination, but soon expanded to monitor temperature, pressure, filling levels, heating temperatures and the control over heating and cooling systems, as far as the tank container is equipped with this. We met a need this way, as evidenced by the fact that we have already placed more than 40,000 sensors on containers worldwide.'

#### WHAT ARE THE CUSTOMER BENEFITS OF TELEMATICS?

Bernard: 'Telematics offers operators, container manufacturers, leasing companies and shippers better insights, enabling them to better monitor product quality and improve the safety and efficiency of the logistics process. You might just think of the temperature at which certain cargo must be transported and delivered in terms of quality, but temperature measurement is often also about safety. Another way to increase safety is by pressure measurement and notifications.

The logistics process can be improved, because you know exactly when a cargo will arrive, and also how long it will remain at a depot before the tank is loaded or unloaded, allowing you to use your resources better. Idle time by non-use, M&R or cleaning can also be made visible. Finally, all this information leads to transparency, which benefits everyone involved in the chain.'

#### IS IMT THE STANDARD FOR TELEMATICS IN LIQUID BULK TRANSPORT?

Dethmer: 'You have become the standard if your products and services are used on a large scale and by most major players in the full width of the market. And that is the case with us. All major stakeholders are customers of IMT and many ask us for customisation of sensors, platform functionalities and data integrations with their own internal applications. We are also the only telematics party that focuses exclusively on telematics for tank containers and tank wagons. IMT is the only party in this market that develops and produces sensors and the entire platform 100% in-house, in order to monitor both the product and the tank. So at this point, I think we can say that we are indeed the standard for telematics in the tank container sector.'

#### DO YOU DEVELOP SENSORS AS GENERIC OR CUSTOMIZED SOLUTIONS?

Frits: 'We offer both generic and customized sensors. A sensor often starts out as a customised product and is then added to our list of generic sensors. We developed our load-unload sensor that indicates whether a rail wagon is loaded or not at the request of VTG, but this is now a generic product. The same goes for the full-empty sensor. This sensor measures from the outside, so in a non-intrusive way, whether a tank is filled less than 20%, more than 80% or somewhere in between.

Incidentally, the operation of this sensor is optimized because we combine its data with those of other sensors on the container in our calculations at our back office. This illustrates that we do not so much sell sensors, but software solutions. Therefore, the software solutions that we offer are just as important as our sensors, be it via our platform (generic or customised) and/or integration of our data in the TMS of our customers.'

#### TELL US MORE ABOUT THE PLATFORM?

Frits: 'We are in constant conversation with our customers within all different target groups, we know them and ask what they are missing. We developed not only sensors, but also a platform for them, with very specific functionalities. This platform enables them to combine the data from sensors with their own data and those of their end customers. We integrate all these data - through our platform - in their own systems. Our platform is open, the customer can choose to use our interface, but he can also build his own dashboard on it. We all use the same web APIs.'

Dethmer: 'Since we are actually a software company, we employ 35 programmers. We only started building sensors ourselves because they did not exist yet. But this has a big advantage. By developing both the hardware and software ourselves, we do not have to shop around and propose half-baked solutions, we can offer exactly the right answer to the question.'

#### DO YOU ALSO MAKE SURE THAT THE ABUNDANCE OF DATA IS MANAGEABLE FOR YOUR CUSTOMERS?

Bernard: 'Yes, because we offer crisp dashboards and the possibility to pick out what you need. The customer can decide which exceptions they want to receive a notification of: if the temperature is too high, if the container does not leave, if the pressure rises, etc.. In other words: 'management by exceptions'. And the data are and remain the customer's.'



#### "ARTIFICIAL INTELLIGENCE AND BIG DATA WILL BECOME MUCH MORE IMPORTANT."

#### WHAT CAN WE EXPECT FROM IMT IN THE NEAR FUTURE?

Dethmer: 'Artificial Intelligence and Big Data will become much more important. In the short term, we will move from alerting to pre-alerting through smart combinations of data and by learning from historical data. We will build algorithms that allow making reliable predictions. I also think that we will go much deeper into the supply chain because there, too, much can be gained with sensor data. People want to know which containers are available, which have been cleaned, which are filled, but also which waste containers are full. We will therefore continue to develop sensors. For instance, we currently have a rupture disc sensor and a chassis load-unload sensor in the pipeline.'

#### LET'S SAY A CUSTOMER WANTS TO START WITH TELEMATICS TODAY, HOW WOULD HE BEST APPROACH THE PLACING OF SENSORS ON HIS TANK FLEET?

Bernard: 'Even if a customer is not yet planning to start with a telematics solution, we always advise to equip every new tank with our digital thermometer as standard. This thermometer is very accurate, shows the temperature in Celsius and Fahrenheit and buffers the measured temperatures for 2 years. We also recommend welding the CLT-bracket on the tank as it lowers the installation time of the communication unit dramatically later on. For a little more than the cost of an analogue thermometer, the tank is then already prepared for the digital age and can be converted from a standard tank to a smart tank in less than 10 minutes.

Of course, it is even better to immediately install a Communication & Location Terminal that transmits the sensor data to our server. An IMT basic set of a few hundred euros already provides the location, outside temperature and cargo temperature several times a day.

You can do the same with any existing container that comes in for the 2.5 / 5 year inspection. In this way, the entire fleet can be ready for the future within 2.5 years, without any hindrance in terms of availability.'

#### LAST BUT NOT LEAST: ARE YOU STILL AN INDEPENDENT PLAYER OR HAVE YOU BECOME PART OF A LARGER ORGANISATION?

Dethmer: 'Despite the fact that it is often whispered in the market that a major player in the sector is a shareholder in IMT, I can formally confirm that this is not the case. IMT is a completely independent telematics provider. We do, however, have a strong bond and commitment with all our customers, which quickly leads to good relations and excellent joint achievements.'





# Telematics & Peacock

"There comes a time when you have to join in. Whoever only starts then, will be too late."



Peacock Container is an ISO tank leasing company with 5.500 containers and HQ in Singapore. Our customers want more insight into their freight traffic. That is why we work together with IMT on smart solutions.

Jesse Vermeijden, Managing Director of Peacock: 'We have been applying sensors for a while now, even though we are in a sector that is not exactly at the forefront of this; leasing companies simply benefit from inefficiency. But there comes a time when every customer will ask for this. If you only start then, you will be too late. That is why Technical Manager Dirkjan Journee, together with TU Delft, has been already conducting two studies on the use of sensors. We are particularly interested in the temperature developments and cooling rates under different circumstances, because our customers want to know this. We were already able to offer them that, just not yet remotely. That is why we contacted IMT.'

#### KNOWING HAS VALUE FOR THE CUSTOMER AND FOR US

'All new tanks are now equipped with a digital thermometer and the special containers also have a CLT (Communication & Location Terminal) with various sensors, all from IMT. This does not only have value for the customer, but also for us. At present, leasing companies do not know where their assets are. This is not experienced as a problem, because it has always been like that, but financiers and insurers see it differently. With trackable containers you can go to more banks and financiers and you can negotiate a lower premium with your insurer.

But the shipper has the biggest interest. He is particularly interested in the platform that IMT offers, because combining data is the key to higher efficiency, product quality and safety. IMT is currently at the forefront in that area, and Peacock is happy to join.'

Jesse Vermeijden, Managing Director Peacock



### Telematics taking over the world: Industry 4.0

Even in sectors where you might not expect it, telematics is taking over. These sectors are also entering the Industry 4.0 era. Horticulture, healthcare and aviation. We investigated for example. How are these sectors transforming using telematics?



#### SMART FARMING & PRECISION FARMING

Thanks to the use of high-tech such as sensors on agricultural machines and drones, remote sensing via satellites, Decision Support Systems (DSS) and robotics, great gains are being achieved in effective agriculture. This technology allows the grower to look exactly at the need per plant or animal instead of per field or herd.

Thanks to measurements by mini robots and sensors (such as temperature sensors, millimetre wave sensors, optic fibre biosensors and moisture sensors), decisions can be more specifically anticipated. These smart farming and precision farming technologies thus contribute significantly to higher crop yields and an improvement in the quality of the harvest. Effective deployment of telematics based on accurate data analysis.

#### FROM INDUSTRY 1.0 TOWARDS 4.0: THE 4TH INDUSTRIAL REVOLUTION

#### 1ST INDUSTRIAL REVOLUTION

Through the introduction of mechanical production facilities with the help of water and steam-power.



First mechanical loom 1784

#### 2ND INDUSTRIAL REVOLUTION

Through the introduction of c division of labor and mass production with the help of electrical energy



First assembly line Cincinnatti slaughterhouses 1870

1900

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#### WEARABLES

Digitalisation is also playing an increasingly important role in the healthcare sector. In fact, healthcare is going through a digital revolution in the form of a technology invasion. These modern technologies are aimed at making healthcare increasingly independent of time and place.

A good example is the use of medical wearables powered by artificial intelligence and big data. These are portable devices and sensors for patients that can measure, for example, information such as heart rate, steps taken, blood sugar levels and blood pressure. These wearables provide doctors with realtime (remote) assistance in monitoring general health issues, chronic diseases and fitness goals. In this way, telematics offer added value for healthcare with a focus on diagnosis, treatment, remote patient monitoring and prevention.



#### REAL TIME AEROPLANE, AIRPORT AND WEATHER SENSOR DATA

In the aviation industry, too, we find successful applications of telematics that result in a completely different approach to aviation. For example, state of the art technology allows a major German airline to collect realtime aircraft, airport and weather sensor data to improve timely performance and optimise operations.

This company also provides realtime tracking services, which enable them to collect and provide data on the position of the cargo at any given time and to monitor the cargo even before and after the actual handling at the airport. For refrigerated transports, they use temperature, shock and humidity sensors to provide 24/7 insight into the tracking status during transport. Aviation: still from A to B by air, but now fully monitored thanks to the use of telematics.





# **Telematics & VTG Group**

Rail freight transport is in stiff competition with other modes of freight transport, especially road transport. To ensure that rail continues to be an attractive transport alternative and is able to fully utilise its strengths, VTG is making huge investments in innovations and digital technologies. By 2017, the company had already begun to equip its entire European fleet with a telematics module. The data collected by the module provides the opportunity to make rail freight transport faster and easier – both in relation to shipments and to the maintenance of the wagons.



## "Digital technologies are enabling completely new services to be developed."

'Telematics systems create the technical conditions required to connect to the wagons and the cargoes transported in them. The positioning this enables and the accompanying option to record information on the vehicles used and to convey this information to customers offers tremendous potential for optimising rail freight transport. The collaboration between VTG and IMT is going well: a loading sensor that we developed together is now allowing loading status to be checked remotely too.

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However, digital data isn't just of added benefit in terms of the cargoes, but also in terms of maintenance and repairs, as it is able to provide valuable information on wear and tear, thereby laying the foundation for mileagebased or, ideally, condition-based maintenance. Compared to today's time-based logic, the downtime of wagons can be reduced considerably, because they are only taken out of service for maintenance and repair work when necessary – and not after a particular period of time. What's more: the more widely available the information is, the more useful it is. The inspection of an individual wagon only helps in relation to certain points, whereas the evaluation of patterns within a network or, ideally, the entire fleet, can deliver valuable insights.

Based on the information that is currently available, existing processes along the entire transportation chain can be optimised - from technical drawing to maintenance. The digital technologies are also enabling completely new services to be developed. VTG isn't just Europe's biggest private wagon hire company, but with its group's own plant, Waggonbau Graaff, it is also in the comfortable situation that it can have technical developments tested in new constructions right away - thereby turning ideas into implementable technologies as soon as possible.'

Dr. Hanno Schell, Head of Technical Innovations VTG

# "The whole of science is nothing more than a refinement of everyday thinking."

- Albert Einstein -



# **'Becduse** we make everything ourselves, cire constant improving.

Supply Chain Manager Thierry Bakker

# quality & safety



With Supply Chain Manager Thierry Bakker we zoom in on the sensors with which IMT makes telematics in liquid bulk transport possible. These are all made, under his critical eye, at IMT's own production facility in Breda, the Netherlands, and sent from there all over the world.

Thierry: 'As IMT we develop, test and produce all of our products ourselves. As a result, we constantly learn and improve. The nerve centre of the hardware on a container is the CLT (Communication & Location Terminal). This small unit contains a GPS location sensor, a motion sensor and a shock sensor that can detect a collision. The communication system in this box sends this sensor data, together with the exact position and the wirelessly received data from any other sensors on the tank container to the IMT server.'

#### DO YOU MAKE THE CLTS AND SENSORS TO ORDER OR IS THERE ANY STOCK?

'Everything is made to order to the wishes of the customer and every product is provided with the customer's logo and a unique QR code sticker at the earliest stage. As a result, we know exactly which components the unit is made of and when it was produced.

#### CAN YOU TELL SOMETHING ABOUT THE CERTIFICATIONS OF THE PRODUCTION COMPANY?

'We are ISO 9001 certified, which guarantees that we do what we promise, and that our suppliers do the same. In addition, this certification requires that you improve continuously. We also work according to the ESD guidelines (IEC 61340) to prevent electrostatic discharge during the production process, because this can imperceptibly reduce the life of your products.

Both our products and our production process are ATEX certified. ATEX guidelines must be applied so that our products can be used in ATEX zones (zones with an increased risk of explosion). Simply put: our products are not allowed to make a spark. Our design is tailored to this, but it also means that our production staff has had ATEX training and that all incoming goods undergo an extremely strict inspection. We are unique in this.'

#### WHAT WOULD YOU LIKE TO SAY TO CONCLUDE?

'That we are all very proud of what we make, how we constantly improve things and our growth. When I came to work here, two years ago, I sent one package a week. Now we are sending packages by full pallets.' "Sensing is only the first step. The difference between various sensing systems is how the information is processed, how-user friendly the system is and how you are supported."

> 02.19 L L 4 BH Höchstzulässiger Betriebsdruck 3 bar

Industry standards are becoming stricter in many sectors. As a company, you must be prepared for this. Or better yet: be one step ahead. Such as Shell Chemicals, this large chemical manufacturer called in the help of IMT.

'Shell Chemicals offers a chemical product that requires temperature guarding because of industry standards. Just-In-Time information will be increasingly necessary across all modes of transport. Our previous system was poorly maintained so we started looking for a more suitable system.

Since IMT had a proven track record of being a large and reliable player in the ATEX sensor market, we decided to start working with them. We currently use their platform to track and monitor the transport of certain products as this fully answers our current needs. It enables us to trace the movement of our products and monitor temperature from the moment the product is loaded to the point of discharge and allows us to respond to early warnings issued by the system.

The platform increases the transparency of our supply chain. This not only translates into value in terms of safety by being able to immediately respond to early warnings, but also as it allows us to offer an improved service to our customers when it comes to giving status updates about the location of their delivery. And that is what we were looking for and found in the IMT platform. Because, sensing is only the first step. The various sensing systems are differentiated by how the information is processed, how it is presented, how user friendly the system is, and how you are supported in case of issues.'

Maarten Roorda, Contract manager Rail transport & Storage; Shell Chemicals Europe

# Continuous work on the best sensors

IMT has its own department where eleven senior hardware engineers from five European countries work on product development of new and support of existing sensors for the tank container and RTC market.

This team builds both generic and tailor-made sensors, always starting with a white paper containing customer functionality requirements. These requirements are converted into one or more prototypes, extensively tested in the field and then prepared for mass production by the IMT production team.

Each IMT sensor is wirelessly connected to the Communication & Location Terminal (CLT) by means of the IMT RF module. This means that a sensor does not need to be connected to the CLT by wires, but that communication between the sensors is wireless. This drastically reduces installation time.

By giving each sensor a large internal memory, it can buffer the data it captures internally, so that data can never be lost, and sensors can often even work without the main unit. A good example of this is a thermometer that can store temperature data internally for 2 years.

In addition, each sensor is developed with the strict ATEX certification as a guideline, so that IMT sensors can also be used in explosion-sensitive areas.

Finally, all IMT sensors are OTA (over-the-air) updatable. New firmware can therefore be implemented remotely on all sensors in the field without anyone having to physically go to the tank. This is a clear example of how both new and existing customers continue to benefit from new development in IMT's engineering team.

# engineering



For the last 50 years, Eurotainer has been the global leader of the tank container leasing industry, serving a wide range of customers from industries as diverse as petroleum, chemical, mining, food and transportation. We at Eurotainer have always positioned ourselves as an innovative market leader and will continue to do so in the future.

'We are committed to providing our customers with the right equipment and the best possible service. In view of that, Eurotainer has decided to equip all its new liquid tanks with the digital thermometer from IMT.

The IMT digital thermometer buffers the measured temperature in an internal log for two years. Even if an IMT telematics device has not been installed, Eurotainer's customers can read out these buffered temperatures when required. In the design and construction of our new liquid tank containers, we will install an additional bracket that allows the easy transformation of a standard tank into a 'smart tank' within minutes, enabling our customers to start using telematics in the cloud right away.

The decision to opt for IMT's digital thermometer came following a selection process that compared a number of potential digital thermometer suppliers. In our decisionmaking process, we conducted extensive tests with several providers and found that IMT excels at hardware, software and support levels. Important factors that played a role in our decision to opt for IMT are quality, reliability and the ability to understand our requirements and needs and those of our customers. IMT has clearly set the standard for digital thermometers and other telematic devices in our sector.'

Marco Beije, Eurotainer Purchasing and Technical Director



# UIIII

EURU 194213 1

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UN PORTABLE TANK

INDE - RID/ADR TC IMPACT APPROVED AAR600

"Eurotainer tanks to be equipped with digital thermometers to provide customers with better service."

eurotainer

HI MA till. 2772131 16-120 100

SINGAMAS EURU 194213 1 2276 N.S.W.

TABE

NOMINAL Capacity

4 BAR

LONG VEHICLE 長車

新日鍋

36 000.KG 19 3651.8

3 590KG

7 915LB

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24 000 L

# "Our platform combines all available data into an effective tool."

Data are the puzzle pieces of all wisdom, but to put the puzzle together, a smart platform is essential. IMT ensures that data from clients, their customers and the data from IMT sensors on this platform are combined into a highly effective tool. What you can do with that is explained by Gert van Spijker, the Software Architect at IMT and Lukas Zügge, Head of Technology.

Gert: 'Sensors are high-tech feelers that deliver important data to our cloud-based platform which than allows you to actually use this information to improve your product quality, logistics processes and safety. Our customers are particularly enthusiastic about our platform. Because not only the data from our sensors on the tank wagons and tank containers comes in there, but also data from the stakeholders involved: operators, tank manufacturers, lessors and shippers. As a result, we not only know where a container is located, but also where it should go, where it should have been by now, what is in it, what the temperature is and should be, how full it is and much more. Our platform combines these data to give the answers the customer requires. For example, we can configure a system for an operator in such a way that he only receives a temperature warning when the container is in Rotterdam, because he is only responsible for that particular zone.'

# 



Gert van Spijker, Software Architect



Lukas Zügge, Head of Technology

#### "SENSORS ARE HIGH-TECH FEELERS THAT DELIVER IMPORTANT DATA TO OUR CLOUD-BASED PLATFORM."

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WHO CAN USE THIS PLATFORM?

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Lukas: 'Anyone who wants to. For logistics service provider HOYER, we are installing sensors on their entire fleet of tank containers and we are helping them to make their data available in their own information and alarm system.

Last year, Bayer Crop Science, a HOYER customer, wanted its own worldwide "Connected Container" solution. We built that for them on our platform. Bayer now has access to HOYER's data, supplemented with its own ERP data that HOYER cannot access. Our platform is therefore useful to both carriers and shippers, but separates the data so that it is only visible to the shipper. To protect these data against attacks from outside, we have been ISO 27001 (data security) and ISO 27017 (applications in the cloud) certified. So we have a powerful multi-tenant system that is also very safe at the same time.'

AOUA

#### NOW I CAN IMAGINE THAT A LARGE SHIPPER WORKS WITH MULTIPLE CARRIERS. AND THEN ALSO WANTS TO SEE THE DATA OF ALL CARGO, REGARDLESS OF WHO CARRIES IT. IS THAT ALSO POSSIBLE?

Lukas: 'That's completely right. This was the case at the chemical group Lanxess AG. As a shipper, they work with a handful of carriers and also have their own containers. They wanted to receive the insights that carriers with IMT sensors were able to give them from all their carriers and containers, but via a single user interface. You do not want a different login and interface for every carrier. We made that possible. Our platform brings together all data, from all carriers and from our own and leased containers. In this case, all the containers involved were equipped with our sensors, but even if a customer uses sensors that are not of IMT, we can integrate those data into our system.'

# Telentessie

"Telematics solutions will dramatically change the global transportation of hazardous goods. Resolute action, speed and the active inclusion of all employees in the process are factors that will determine its success."

HOYER Group

HOYER is a global market leader for transports of liquid goods by road, rail and sea and has been a client of IMT since IMT started its business. Why does a worldwide operating company attach so much value to the integration of telematics?

8.000 KG

'HOYER is equipping its entire tank container fleet with telematics for three important reasons: better use of capacity, significant improvement of the quality of the transport chain (punctuality) and considerably enhanced safety of hazardous goods transportation. Our smart fleet has led to a massive improvement of tank container movements throughout the world, giving us interesting insights into the use of different tank types, bottlenecks in the global supply chains and the movement of different cargo types. Thanks to loading information such as temperature, pressure or filling level, the monitoring and safety of hazardous goods transportation have reached an unprecedented level. We started working with IMT because we believe that the most important requirements for a telematics system are robustness of the devices – they have to be able to withstand harsh everyday transportation conditions over many years –, longevity combined with low servicing costs, and reliability combined with the lowest possible failure rates. And, last but not least, the availability of user-friendly, standardised interfaces. IMT is able to meet all these requirements.

With our smart logistic concepts, we are able to continuously develop and offer improved products that relieve our employees and customers, so that they can focus on vital tasks. These telematics solutions will dramatically change the global transportation of hazardous goods in the future. In our experience, resolute action, speed and the active inclusion of all employees in the process are factors that will determine its success.'

Heiko Rumfeld, Director Business Unit Netlog at the HOYER Group

# "If you don't have time to do it right, when will you have time to do it over?"

- John Wooden -



## IMT, your telematics partner

IMT is an independent telematics solution partner for the tank container and tank wagon industry and is by far the biggest supplier of telematics solution in this sector. But what do we have to offer?

IMT develops and produces standard and customised industrial intelligent sensors which generate and transmit data about the tank container and its cargo. Our innovative research has led to filing several patent applications. The standard sensors include a tank container's location, ambient temperature, cargo temperature and cargo pressure. The heating sensor shows how long, where and at which temperature the tank container was heated by a third party.

Also, heating and cooling systems that are installed on the tanks can be remotely controlled via IMT's platform. IMT also develops tailor-made sensors based on the wishes and specifications of our customers.



#### We'll let our numbers do the talking

patents on sensor technology for temperature and liquid level sensing

+40,000 IMT tank sensors in the field, adding new ones every day

certifications on products and organization: ATEX, ISO 9001, ISO 27001, ISO 27017,...

35 software developers focussing on tank telematics to solve all your needs

**TRILLIONS** of bits and bytes becoming

your data in your dashboard the way you want it

100% in-house R&D, development and production. We do it all ourselves

hardware engineers building the sensor that you need. From scratch

**16** different nationalities are working at IMT

**100%** independent telematics supplier, no tank manufacturer, lessor, operator or shipper is shareholder of IMT

# It's your time. Take over.

THESE ARE EXCITING TIMES. WITH EXCITING CHALLENGES. IMT HELPS YOU ADAPT TO THEM. SO STEP UP TO THE CHALLENGE. GET IN CONTACT WITH IMT AND START TAKING OVER.

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#### SOURCE

https://www.linkedin.com/pulse/nature-things-mickey-mcmanus | Strategy Analytics M2M Strategies advisory service, McKinsey Global Institute, NYTimes.com | www.servicemax.com | DFKI GmbH | The future of technology in agriculture by Silke de Wilde (STT Netherlands Study Centre for Technology Trends) | Accelerating precision agriculture to decision agriculture, by the Australian Government - Department of Agriculture and Water Resources | Precision agriculture: what is needed? by Corné Kempenaar - Wageningen University & Research (The Netherlands) | Global Market Insights | WT, Wearable Technologies Conferences (various articles) | The Digital Health market in the Netherlands and Switzerland by Embassy of the Kingdom of the Netherlands in Berne, Switzerland | WT, Wearable Technologies Conferences | IoT Tech Expo Europe 2018, Amsterdam

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### **Bronvermelding**

#### When things wake up | p 6 - 7

Source 1

https://www.linkedin.com/pulse/nature-things-mickeymcmanus/Mickey McManus Influencer Visiting Research Fellow at Autodesk, Senior Advisor at BCG, Co-Author, Trillions

#### A few things you need to know about the internet of things | p 10 - 11

Source 1:	Strategy Analytics M2M Strategies advisory service,
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Source 2:	www.servicemax.com
Source 3:	

#### Telematics taking over the world: Industry 4.0 | p 24 - 25

Source

DFKI



