YOU MAKE GEOSPATIAL MATTER

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IMAGEM

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PREDICTING THE CORRECT QUESTION

WE LEARN BY ASKING QUESTIONS, THE ANSWERS TO WHICH RAISE FURTHER QUERIES. THUS, WE ACQUIRE KNOWLEDGE ALONG THE WAY. I DARE TO PREDICT THAT LOCATION INTELLIGENCE WILL PLAY A MORE IMPORTANT ROLE IN ASKING THE RIGHT QUESTIONS.

We were accustomed to consulting maps for directions – to locate where we were and where we want to go. Nowadays, we use apps on our smartphones not only for directions, but also to know if we can, for example, go to the supermarket without getting drenched in the rain.

In the simple case of weather apps, most of us don't realise that the information comes from a combination of integrated intelligence from satellites and other sensors that measure weather variables, calculate smart algorithms for predictions, visualise forecasts and use GPS from our phones. We no longer depend on news channels for weather forecasts, but simply look at our phones. By doing so, we gather information on whether it's going to be rainy in the coming hours and its intensity so that we can go about our lives without interruptions.

This is data-driven decision making – we use predictive information to proactively improve our lives. Within the realms of information technology, this phenomenon

is known as 'API Economy': a collection of business models and channels based on reliable access to data and functionalities.

The economy of the 'Application Programming Interfaces' is currently descriptive in nature but is quickly transforming into predictive. Soon, information systems will evolve even further into prescriptive and cognitive. Although artificial intelligence will play a crucial role, the basis will be formed through collaboration between systems using interfaces (API's), that will allow software components to communicate seamlessly and increase efficiency and profitability.

"In the future, systems will evolve to become much more predictive and cognitive."

"I believe that people have a lot to offer and that location-intelligence helps predict the right questions. "

WOUTER BROKX, PRESIDENT IMAGEM

We believe in location-based collaborations, because coordinates are the universal building blocks of our environment. Communication plays a crucial role in collaboration, that applies to databases and information systems but even more so to people. With advanced communication, the correct use of language is more than choice of words. It entails using context and applying things like correct intonation and timing.

"Visualisations allows people to record information much faster than through words or numbers."

A good translator understands the context and applies it to make communication and collaboration seamless and successful. In the field of information technology, context is obtained from big data.

Multi-dimensional information obtained from big data can still be very complex to comprehend quickly and it changes constantly and dynamically. Visualisation of information allows people to record information much faster than through numbers and words alone.

Interactive visualisation makes it possible to ask intelligent questions and get answers. It literally provides insight that is needed to give meaning to information and enables timely and smart decision making. This is what we mean by 'location intelligence.'

Since everything has a location, we can create systems that quickly provide insight into our living environment. Every answer in turn raises new questions, and this cycle makes us smarter. Predicting answers starts by asking and predicting the right question, thereby accelerating our learning process.

I believe that people have huge potential, and that location-intelligence helps them predict the right questions. ∎
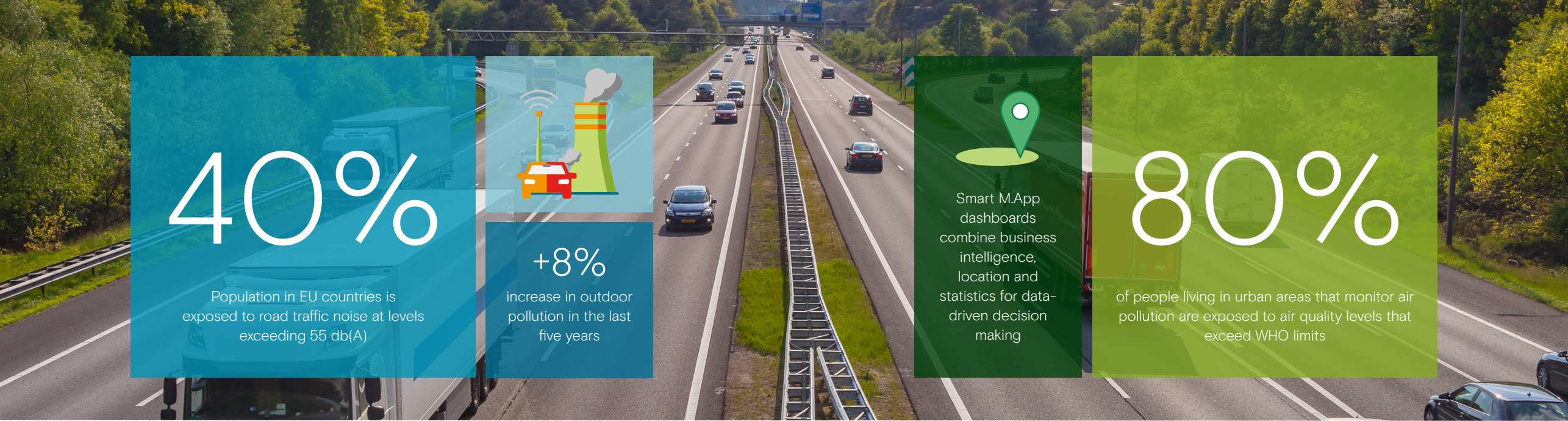
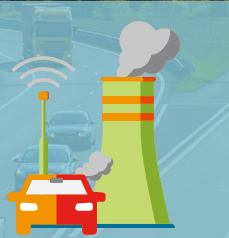**WOUTER BROKX**
PRESIDENT, IMAGEM

60.000x

Visual content is processes faster than text by people

40%

Population in EU countries is exposed to road traffic noise at levels exceeding 55 db(A)

+8%

increase in outdoor pollution in the last five years

Smart M.App dashboards combine business intelligence, location and statistics for data-driven decision making

80%

of people living in urban areas that monitor air pollution are exposed to air quality levels that exceed WHO limits

DATA VISUALISATION IS ESSENTIAL FOR DECISION MAKING

THE GOVERNMENT GATHERS AND USES DATA TO COORDINATE POLICY IMPLEMENTATION, ANTICIPATE DISASTERS, AND/OR TO MAKE DECISIONS. THE MUNICIPALITIES OF NIJMEGEN AND ALMERE AND THE PROVINCIAL WATER-BOARD OF DELFLAND IN THE NETHERLANDS DISCUSS DATA-DRIVEN DECISION MAKING.

MAKING DATA TRANSPARENT

Paul Geurts is an information architect at the municipality of Nijmegen in the Netherlands. He says, "Two years ago, we initiated a program to make all municipality data integrated and transparent. While technically this is now possible, we are tackling privacy issues." Although integrated and intelligent, their data is not (yet) used as a means to make decisions. "We do analyse information derived from

the multi-source data to know the success rate of policy implementation. For example, we perform predictive analysis on welfare fraud. This helps us understand what we should do right now in order to prevent the situation from escalating. Decisions we make are based on intuition, data and professionalism."

Paul feels that visualisation of data is often very useful and feasible. "Take public

space as an example; data on necessary maintenance and even complaints on a map helps us organise dynamic planning activities better. Graphs and maps help make large amounts of data coherent and transparent."

He advises other municipalities to work in a more data-driven fashion. "Data means information and can be used to align policy with reality. Ideally this can form policies based on daily practices."

PAUL GEURTS
INFORMATION ARCHITECT, MUNICIPALITY OF NIJMEGEN

"Data means information and can be used to align policy with reality. Ideally this can form policies based on daily practices."

KEEPING THE COUNCIL INFORMED

Gerhard Dekker is the research and statistics manager at the municipality of Almere in the Netherlands. He says that the city council has adopted the approach

of making more and more data-driven decisions.

"It is important for the council to be well informed. For example, if the council meets to discuss self-employed professionals in Almere, the data ensures that they know in advance how many freelancers the city has, their location and type of work. Information gathered from multi-source data immediately provides a clear picture and saves precious time, as all council members can acquaint themselves with relevant intelligence before the meeting."

Gerhard states that Almere's approach to inform the council as broadly as possible is innovative. However, the buck doesn't stop there. "Of course, we also work with complex technological calculations, for example to get a better grasp at budgets by forecasting recipients of social benefits from the city for the next five years."

On data visualisation, Gerhard says, "we choose the most appealing form to visualise data. Sometimes simply through a PowerPoint presentation, then another time through an interactive dashboard with 'live' data. During a neighbourhood meeting it would be handy to walk through the neighbourhood with virtual reality glasses on, it doesn't always have to be that futuristic. Sometimes it's much more meaningful to have a spontaneous conversation in front of the local supermarket, rather than presenting 200 pages of statistics."

"We choose the most appealing form to visualise data, like an interactive dashboard with 'live' data."

GERHARD DEKKER
RESEARCH & STATISTICS MANAGER, MUNICIPALITY OF ALMERE

SMART DEPLOYMENT OF SYSTEMS
Alous Spaanderman is data coordinator at the Delfland Water Board in the Netherlands. At the water board they "collect data by ground surveying, aerial photographs, building plans, project plans and permits, and use the data from these multiple sources for water system analyses." It is important for the water board to make decisions on water-levels, dole out permits, enforce measures in event of a calamity, and define policies.

During a flooding, Delfland started making decisions based on all available data. "We support this by using smart and interactive systems. Delfland uses a system that has been especially developed for decision support in water management concerning flood risk-management, flooding, disaster mitigation and management and spatial planning."

Alous states that data visualisation helps the water board comprehend information and perceive important patterns and connections. "With the deployment of geospatial solutions, most of the data is already being visualised with analytics being mapped out. Realistic 3D stereo visualisations are captured in their systems. In the local Dutch series 'When the dikes break' the ground-situation is depicted realistically. Furthering our cause of capturing real-time situations, we are working on smart interactive dashboards that combine location intelligence with statistics." ∎

ALOUS SPAANDERMAN
DATACOORDINATOR DELFLAND WATERBOARD

90%
of all natural disasters are water-related

Read more on our website:
imagemnl.com/smartmapps

MAKE GEOSPATIAL MATTER

WHERE MORE MUST BE DONE IN LESS TIME, USERS NEED STANDARD
SOLUTIONS TAILORED TO SUIT THEIR SPECIFIC REQUIREMENTS.

Information technology is changing our society at an accelerating pace, increasing the requirements that are demanded from the software which we use. Where more must be done in less time, users need standard solutions tailored to suit their specific requirements. This trend to use platforms providing custom tailored solutions based on standard software technology is consolidating this idea.

With the introduction of Smart M.App platform it has become possible to substantiate requirements, and realise benefits quickly using apps that match the impending need for insight into data and information. These apps are interactive dashboards that combine Business Intelligence (BI) with location and statistics, and provide a firm basis for data-driven decision making.

In addition to traditional solutions for remote sensing, photogrammetry and GIS (geographic information system), the Smart M.App platform also combines workflows and dynamic dashboards with the spatial modeler at its core. This integration offers endless new possibilities for users, as we've seen ourselves with our first users.

An example of this scenario is the new Rheticus Network Alert app. Based on enormous amounts of measurements calculated from satellite data, the asset managers can gain immediate insight into the consequences of displacement in soil that impacts their infrastructure such as houses and building, bridges, roads and so on. This makes risk mitigation and management possible on accurate and real-life information.

"Location plays a crucial factor in many of the decisions that entrepreneurs, policy makers and researchers make daily."

With our customers, we have implemented multiple apps that help the Smart City initiatives. These apps are easy to customise by other organisations you to inherit proven solutions that are efficient and cost-effective.

The Smart City theme already has 10 distinct apps ranging from measuring displacements in soil, road quality, and sewers, to emissions. All these apps are based on open-and-standard data formats enabling seamless integrations and communication between systems.

This platform allows us to collaborate more with our users and partners to co-create domain-specific solutions. We continue to develop and grow together with you.

You make geospatial matter! ∎

1.3m
people move to cities every day. Exponential population growth in cities increases the need for Smart Cities

PATRICK DE GROOT
BUSINESS DEVELOPMENT
& SALES OPERATIONS
MANAGER, IMAGEM

LOCATION-BASED DECISION MAKING

CAN WE ENSURE THAT LOCATION IS INTEGRATED AND CRITICAL WITHIN THE
INFORMATION-AND-COMMUNICATIONS TECHNOLOGY (ICT) LANDSCAPE IN
THE NETHERLANDS AND GLOBALLY?

Growth in the location information sector is predicted to be more than 300% in the year 2020 as compared with 2015 according to a market report (marketsandmarkets.com). This prediction is not shocking, given that almost everyone today – from teenagers to grandparents – use their smart phones that works with location services.

Compared to the past it is now possible to have all kinds of specialised information accessible simply at the touch of a button.

While location is crucial for smart decision making, it is not commonly expedited. For example, maintenance of historical data, population studies, cadastral or property information, all need the location component as a connecting factor.

However, setting up a geospatial system as the central platform for all IT systems integration in many scenarios is not the obvious solution or the focal point. An alderman won't expect or prefer to use a geospatial system to quantify the effects of budgetary policies, rather they would simply prefer visual analysis of the real-time information with location as a component. On the other hand, an asset manager requires location information to manage his on-field inventory, but he is still not a specialist in geospatial technology. In both scenarios, although location plays a crucial role, it is not the objective of the users.

The key to implementing location-centric solutions is simplicity. While complex calculations are necessary, the end-solution must be flexible and clear enough to cater to the intended audience, ranging from executives and managers to users and field-crew.

Such solutions involve effective communications where the core (location-based) technology ensures that focus remains with the desired usability.

This requires problem-specific information flows represented through integrated dashboards where business and location intelligence combine and communicate seamlessly. This is only possible when utilised on a platform built around the idea of seamlessly translating relevant data.

IMAGEM implements these solutions based on platforms provided by Hexagon Geospatial together with partners and customers in a wide range of processes and organisations. ∎

300%

expected market growth geo-information sector in
2020, compared with 2015

Read more on our website:
imagemnl.com/dashboards

BRING ON 2018!

THE CONCEPT OF MACHINE LEARNING WITHIN THE GEO-INFORMATION DOMAIN HAS GREAT POTENTIAL. THIS IS PRIMARILY DUE TO THE AMOUNT OF STRUCTURED AND INDEXED DATA USED. IN 2018, HEXAGON GEOSPATIAL WILL TAKE THE FIRST STEPS TO MAKE MACHINE LEARNING APPLICABLE TO THEIR USERS.

Every year in the summers, Hexagon AB hosts HxGN LIVE in Las Vegas. the week was jam-packed with information for partners and end-users.
Hexagon Geospatial (technology partner for IMAGEM) revealed the upgrades expected with the next versions of Power Portfolio and M.App portfolio, expected to release in early 2018.

The first look of the upcoming functionalities was impressive. But it is not only about functionalities. Hexagon Geospatial is steering towards implementing the concept of Machine Learning into their technology; to process sensor information dynamically into information (IoT) and cross-integration of various software components.

The new engine (Spatial Modeler) is further developed, new operators for machined learning, Object-Based Image Analysis (OBIA), and vector are added. The new release will see integration of Spatial Modeler in products such as

ERDAS IMAGINE, GeoMedia, M.AppX and M.App Enterprise. Sensor and IoT support is provided by EdgeFrontier, which can initiate events on sensor/web/database content. Users can define triggers in EdgeFrontier to send automated emails, tweets and mobile text message based on information that is changed, for instance when a specified threshold value is exceeded.

Here's an example how all these upgrades can fit together – in 2018 there will be tooling available to build an alarm system based on dynamic sensors and databases. This information can subsequently be used and upgraded through Machine Learning to show results and predict scenarios on dynamic dashboards.

Isn't that exciting? Bring on 2018! ◼

WIM BOZELIE
TECHNOLOGY DIRECTOR, IMAGEM

"Deep Learning is a part of Machine Learning which tries to artificially mimic the human brain."

"IMAGEM helps us with data visualisation solutions to understand the information and perceive patterns and connections that matter."

ALOUS SPAANDERMAN, DATACOORDINATOR
DELFLAND WATERBOARD (**P. 11**)

WE ARE IMAGEM

We are translators and location intelligence is our domain. We translate data from the dynamically changing environment to make data-driven decisions. With our hybrid software platform, we convert real-time data into usable information. Self-learning algorithms embedded in our solutions help continually improve predictions.

The map of the future is a smart app that translates the complex world into dynamic information and interactive infographics. This creates insight, enabling us to adequately respond to changes in the world around us. We translate geospatial data and business information into knowledge and insight, and give meaning to things that matter. We help you get a better grip on the future.

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