

## NEW ELEMENT ADDED TO INTERGEO

# Spatial Data and Smart Cities are Interdependent



A new element is being added to Intergeo, Europe's largest geo-IT conference and exhibition this year: Smart Cities. This new part of the conference is being developed by the intergeo team in cooperation with Dr Chirine Etezadzadeh and her colleagues. She is a German expert on 'smart cities' and believes strongly that an interdisciplinary approach, certainly

within the geo-IT sector, is crucial for real results. But efficiency should not be the only goal; social cohesion is also essential to ensure the future viability of cities.

(By Frédérique Coumans, contributing editor GIM)

Hinte GmbH, the organiser of Intergeo 2016 in Hamburg, Germany, invited SmartCity.institute and the German Federal Smart City Association to help develop a new format, referred to as 'Smart City Solutions'. The format will exemplify the connections between geo-IT and cities of the future in an exhibition and a small conference. Over the coming years at Intergeo, this theme will be further extended to effectively address this issue in Europe.

Most smart city data is geo-IT related because a smart city solution always includes the question of 'where?'. Accurate, complete, up-to-date, and object-oriented geodatabases are crucial. "Shared, partially open databases are the basis for any smart development," states Dr Etezadzadeh, who leads both of the German organisations that helped the Intergeo team and is experienced in the fields of energy, mobility and city development. A simple example: "Think of 'robo-taxis', which are a central aspect of current smart city visions. The use of fully automated cars is impossible without high-resolution maps and other shared geoinformation databases."

## Engaged urbanites

The precise definition of 'smart city' is the topic of much debate. Is it not the case that many projects with the smart city label are merely a re-branding of existing IT and other technological services with a 'smart' twist? Dr Etezadzadeh agrees that true smartness requires more than just a technical upgrade. Cities have become aware of this and are beginning to think about what smartness really means for them. Sensors and digital communications deliver big data to local governments and urban stakeholders who use the resulting information to do things better, faster and/or cheaper. But efficiency is only half the story. "Reasonable urban development is inextricably linked to autonomous citizens who stand up for their interests, sovereignty, quality of life and sustainability goals." In her opinion, social cohesion is essential for the realisation of viable smart cities. That requires broad cultural change to offset the urban trends towards anonymity and singularisation. "I don't think that consensus is the target. It's more the direction of impact we should agree upon. Municipal authorities should encourage and incentivise opportunities for urbanites to become engaged and participate in shaping the future of their cities and to actively assume responsibility. Such a culture builds the basis for resilient cities. The prerequisites for this transformation are more awareness and education so that people develop an interest in their environment. This will help to activate and encourage them to assume responsibility. Tools based on digitisation can indeed facilitate this process."

## Interdisciplinary approaches

One focal point at Intergeo will be the high demands placed on geo-IT systems by smart cities. Just imagine the amount and the complexity of data, the management of data ownership and the required access rights. Then consider the correlation-based algorithms designed to achieve outcomes that serve the decision-making process. This system needs to be managed and kept reliably functional. Problems in these vulnerable systems lead to disruptions that can be experienced immediately. Resilience strategies in this regard are real challenges and need to be integrated through intelligent design. Dr Etezadzadeh: "Don't think about smart city solutions, products or processes without creating them to be resilient against all kinds of imaginable threats. And we won't be able to tackle the growing complexity without using interdisciplinary approaches."

Interoperability – the ability of products, systems and processes to be integrated in today's and future systems – is key to smartness. In

order to create interoperable system features, a cross-sectoral exchange of (spatial) data, knowledge and strategies is needed. One example in which many Intergeo participants are actively involved are the smart grids that are being developed by energy companies, in cooperation with GIS developers, municipalities, housing companies, home owners and suchlike to provide neighbourhoods and industrial parks with energy based on decentralised energy production. “A revolutionised energy sector forms the basis of a smart city,” Dr Etezadzadeh remarks. Concerning the need for interoperability, she gives an example from the mobility sector: “If someone developed a car in his garage without considering urban technical developments that are currently being planned, it wouldn’t be possible to integrate that car in future traffic systems. Its on-board systems, for instance, would likely be stand-alone solutions, car-to-car communication wouldn’t work, and car-to-infrastructure communication would be unthinkable.”

## Protecting autonomy

Some things are easy. As a minimum, topographic data distributed by the national mapping agency can be commonly used so that everyone uses the same spatial ‘single source of truth’ as a basis. But if you delve into complex policy issues, many efforts to share data and information systems are thwarted in practice by people’s desires to protect their organisation’s, their department’s or their own autonomy and power. “Sectoral thinking is a challenge, even within companies or municipalities,” confirms Chirine Etezadzadeh. “Structural, organisational and process change is a prerequisite for overcoming a ‘silo mentality’. People need to realise that one person’s or company’s knowledge lacks power without information from others. New ways of thinking are required, new cooperative business models and new regulations. While the old economy is gradually becoming aware of this reality, the new economy creates sources of knowledge that nobody could ever imagine before. Unfortunately, these sources won’t be used collaboratively. Data security, ownership and distribution is an enormous and challenging task.”

In general, Industry 4.0 – with its intensive automation in manufacturing, the Internet of Things and cloud computing – is not imaginable without sharing. The major challenge will be to identify who should get access to which data and to what extent. The smart city expert stipulates: “In my opinion, this is the core question that needs to be answered in the current digitisation process.”

## Conflicting needs

There are some other facets to this theme. Installing sensors in everything and asking citizens to do as much as possible via digital means generates big data for municipalities, energy companies, insurance companies, public transportation systems, etc. It is not the new infrastructure that makes the city smarter, but the data that flows through it. Most local governments do not have enough skilled personnel to make cities smarter; they insource the necessary expertise from the private sector. A concentration of power through those dataflows being in the hands of businesses might not coincide with citizens’ needs. There is the risk that the big data collected through smart city projects might primarily be mined for the purpose of making businesses more profitable and for obtaining a better marketing profile of (individual) users in order to sell more products/services. And is there not a distinct possibility that a society of surveillance could arise, in which you can no longer be lost in a crowd and your behaviour could be tracked all day long, by all kinds of organisations? Chirine Etezadzadeh sees such downsides too. “Those aspects do in fact pose a real, multifaceted threat. I have noticed that, for this reason, German cities are not blindly implementing all potential digital applications, but are beginning to think about this topic in a holistic manner. A problem associated with this is the speed at which technology is developing. In any case, new technologies will continue to proliferate. Nevertheless, we can assume that cities will not be the main gateway to our private lives; anybody who uses a smartphone does not have to give any thought to the upcoming digitalisation and to the potential threat it may pose in cities. We must consciously decide where we want to allow digitalisation to become part of our lives and where we don’t. This is a task for autonomous consumers and it requires public discourse. We need informed participants in order to conduct an intelligent discourse. Digitalisation has the potential to do a lot of good. We need to tap into this potential and have the courage to create new opportunities in some areas. But you always need to be aware of where the next step can take you and then decide whether you want to take that step.”

### Chirine Etezadzadeh

Dr Chirine Etezadzadeh (economist) is the president and founder of Germany-based SmartCity.institute and of SmartCityNews.global and is CEO of the German Federal Smart City Association. She regularly holds university lectures on product development for smart cities. Her book titled *Smart City – Future City?* is published by Springer Publishing in both German and English.

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