HARNESSING THE SMART CITY SPACE OF TOMORROW

New Frontiers for Geomatics

Over the next decade, the real-time smart city is likely to become a reality in many of the world's cities. Co-ordination, communication, coupling and integration are all different methods involved in developing the smart city space of tomorrow. This will require new types of databases, new methods of mining and pattern analysis, and new software developments that largely run on digital networks while at the same time being related to traditional movements and locational activity. Extremely clear conceptions of how location intelligence might be used for planning at different scales and over very different time periods are critical to this focus.

Although the 'smart city' is no longer a new concept, there are still various interpretations of what a smart city actually entails. The term 'smart' applied to cities stems from the concept of 'smart growth' which has been widely used to imply intelligent behaviour. Smart cities are conceptualised through the synergy of a widespread ICT layer embedded into the urban fabric together with economy and governance that are driven by innovation, creativity and entrepreneurship (Kitchin 2013). But cities are complex systems par excellence; they are more than the sum of their parts and are becoming more complex through the very technologies that we are using to understand them.

The Impact of Hyperconnectivity

Hyperconnectivity has changed the way we do things and every interaction in our lives. Cities are being built with powerful digital networks, allowing the hyperconnectivity of digital devices that are already producing big data which holds the promise of what some see as a truly real-time smart city. North America and Europe combined make up 70% of today's global big data total (McKinsey Global Institute 2011).

Cities, however, can only be really 'smart' if there are intelligent functions that are able to integrate and synthesise this big data for some purpose – namely, ways of improving the efficiency, equity, sustainability and quality of life in those cities. In fact, the term 'smart city' has been adopted by companies that are developing global ICT – from infrastructure such as networks to software as services. These companies are beginning to generalise their products in this way, since they see markets in cities representing the next wave of service development in today's globally distributed world. Leaders in smart-city capabilities are companies such as IBM, Cisco, Buro Happold, Siemens, GE, Accenture, SAIC, Alstom, Mitsubishi Heavy Industries, ABB, Black & Veatch, Oracle, Samsung, Philips, SAP, Home Depot and Autodesk, all of whom are looking to make their mark in the smart-city space of tomorrow.

Technological Development and Personal Use

We are already seeing a growing trend towards a better use of personal data by governments, such as through embedding technology in utility meters to collect and analyse water, gas and electricity usage per household. Large-scale experiments have also shown the huge diversity of individual locations and tracks of communication activity as well as usage of services left by citizens interacting with each other in cities that are becoming smarter. This data offers enormous potential for gaining new insights into urban dynamics processes at high temporal and spatial resolution at the scale of cities, provided that enough effort is put into resolving privacy concerns (Batty et al. 2012).

The issue is no longer where and how data is collected, but rather when and how this data is used. We must be able to integrate and synthesise data in motion, generated by every one of us, having its most value at the moment it has been created and consumed. While insights from our past will continue to guide us forward, the importance of our maps will be measured not by what they say but by what we can do with them.

A Laboratory of Innovation

The prospect of making city maps function in real time from routinely location-sensed data is now a clear prospect and smart cities should

evolve intelligence functions – in the form of laboratories – that enable their monitoring and design. The competitive edge that a city offers is crucial to such location intelligence, and it is not dependent on its size. Small and midsize cities should not be behind big cities in harnessing intelligent functions to make a city run smarter. In fact, they provide a better laboratory of innovation for co-ordinating the many different components that make up a smart city. They can deliver a durable and cost-effective structure to test out early-stage ideas through learning how to develop rapid prototyping and identifying the returns from better use of big data by citizens, government and businesses. Companies will run less risk in providing hardware, software and data solutions enabling these cities to be smarter. Meanwhile governments will be able to compete for scarce resources in the highly favourable conditions generated by engaging users of services and tapping into the interests of citizens whose traditional focus is on the quality of life within their communities.

New Career Opportunities

The future belongs to a very different kind of person with a very different kind of mindset: creators and empathisers, pattern recognisers and meaning makers (Pink, 2005). A geomatics engineer can be this kind of person.

However, a recent survey designed to assess usage and trends in location intelligence shows the need for fostering deep analytical talent in geomatics (Ventana Research 2013). Some key facts show that businesses are increasingly reliant on location to drive operational efficiencies, find ways to better target their customers, create mobile operations and make smarter strategic decisions. The facts are as follows:

- Information about location is very important (41%) to organisational processes and performance.
- Satisfaction with location analytics is mediocre, with only 12% being very satisfied and 36% being satisfied with internal organisational efforts.
- Business-to-business interaction is most important (58%) to improve the use of location-related information.

Location intelligence goes beyond combining location analytics, data mining, service-oriented mapping, visual analytics and simulation modelling. Instead, location intelligence is an emerging scientific field that is giving rise to new data scientists who will combine the skills and talents from often disjointed areas of expertise (e.g. geomatics and sociology). The question is, what will happen when we start providing students with adjacent skills? What do you get when you combine deep computational expertise with creativity and a socially insightful view of the world? The McKinsey Global Institute report anticipates that demand for this talent could reach 50% to 60% in the next 5 years.

References

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