Editorial: Geographic information in information and communication technologies

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The use of computer technology for both quantitative and qualitative analysis in planning and urban design is a requirement for most practitioners and researchers. Analysis and simulation of land processes and patterns requires, among other things, digital data to display, analyse and simulate phenomena and propose scenarios.

New, faster, real-time, higher resolution data sensors allow the collection of data that is often fed live directly to the user. Advances in computation together with new waves of theories and models allow on-demand, real-time interactive representation and simulation of the real world (Silva and Wu, 2012; Wu and Silva, 2010).

Therefore, it is now common sense that planning and urban design require information and communication technologies (ICT) and geographic information (GI); these systems provide opportunities that go beyond pure research purposes to provide innovative solutions to today's problems.

The Climate Group (2013) estimates that in total, ICTs could deliver approximately 7.8 GtCO₂eq of emissions savings in 2020. This represents 15% of emissions in 2020 and therefore a significant proportion of the reductions below 1990 levels that scientists and economists recommend by 2020 to avoid dangerous climate change. In economic terms, the ICT-enabled energy efficiency translates into approximately £600 billion (\$956.28 billion) of cost savings.

The UK Trade and Investment Department states that software and IT services have a market value of £58 billion per annum (UKTI, 2013). Estimates as to the size of the geographic information business for location related software, professional services, data and hardware in 2012 are around £1.23 billion, according to the Association for Geographic Information (AGI, 2013)

In this context how do we position ourselves as academics, practitioners, government decisions makers and association representatives in order to face the challenges of such substantial market requirements?

With a multibillion pound revenue and thousands of direct jobs created from GIS and ICT one would expect Europe to follow the global trend of ringfencing GI and ICT areas. Nevertheless, and almost in contrast to the increasing demand of professionals, the past 20 years registered a reduction of university degrees with most undergraduate programmes cutting teaching owing to costs associated with setting labs, maintenance and IT technicians. With time, and with the reduction of undergraduates feeding the labour force and reduced research for post-graduate positions, a wider gap will emerge between market needs and academic supply of expertise. At the European scale it is clear that the evolution of Europe is closely linked to the collection and analysis of data (Silva, 2012), a successful data-led policy requires informed decisions, that in turn require up to date data and knowledgeable experts to collect, analyse and inform policy, theory and practice.

With such high technical requirements and the need for specific hardware, software and expertise in such diverse areas of implementation, are we producing the right type of expertise? Are we producing innovative research to feed the development of new computer applications and new analysis? Are we producing enough of the necessary qualifications to feed this increasing need of labour force?

This themed issue of *Urban Design and Planning* aims to shed light on this vast subject by presenting some of the core foundations of geographic information and discussing how planning support systems can contribute to the development of solutions that will help create sustainable development, clarifying concepts and pointing to the main challenges (Geertman, 2013); including data and data usage (Nabian *et al.*, 2013) and customisation of available tools and methodologies (Wu and Silva, 2013)

Costa (2013) validates the hypothesis that it is possible to build an information system on energy performance of existent buildings to support energy planning at the urban scale using a participatory approach. Lieske and Hamerlinck (2013) address the utility of planning support systems for site planning applications developing a new system that proposes different

alternative scenarios. Sepe (2013) develops PlaceMaker, a flexible software tool that assembles multiple data in order to describe the identity of places and produce appropriate planning interventions. Ceccato (2013) discusses the use and integration of GI (and spatial analytical tools) in urban safety research and planning. Procaccini and Pineschi (2013) use an EC project (Plan4all) to discuss the importance of spatial data infrastructures and the key role of the Inspire directive.

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