Report to the Urban Agenda Digital Transition Partnership on "Digitalisation of Urban Planning"

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Content

1. Most Significant Trends Relevant To Digital Planning

These are ongoing trends …

- **Exponential growth in volumes of spatial data** immediately usable through Geographical Information systems and tools as they are increasingly free to access (open data), easily found (thanks to thematic repositories and metadata standards) and easily exploited (thanks to standard data formats and open source applications available to process and make sense of that data.
- **Increasing availability of free or inexpensive web based geographical tools** which are easier to master than the earlier expensive, proprietary and complex GIS tools.
- **Major UN drive to set up a Global Spatial Data Infrastructure (GDSI)** to support implementation of three major 20 year long programmes agreed between Dec 2015 and Dec 2016 (Paris: Climate; New York: SDI; Quito: Urban Agenda) complementing its other core mandates on data collection (population census; trade, economic, environment statistics)
- **Convergence of multiple programmes at EU level supporting a vast expansion of regularly updated data resources** on environmental, transport, energy, economic, infrastructure and population conditions locally, which can be mapped down to the km2 and used to extrapolate scenarios to plan, predict, monitor the impact of policy decisions.
- **Thematic Data Sets available across the EU** are set to grow massively in the coming years in part due to electronic data **reporting obligations** set in various EU legislations in many domains but particularly environmental, energy or communications related. This data is typically hosted at EU level repositories as is the case for the European Environmental Agency, based on the Framework put in place by the *Inspire Directive.*
- **The 2021 Population and Housing censuses** led by Eurostat, will involve mandatory reporting of very granular data and is to be systematically geocoded (1 Km2). *It should represent a major milestone.*

2. Most Significant Risks and Opportunities for Local Authorities

What Will Ensure Awareness and Participation in Digital Innovation by Local Authorities?

Local authorities and urban planners ought to be regarded as a key user group for all spatial data and digital planning developments funded by the EU. However, in order to use the results of all the relevant EU funded projects and resources, planners from cities across the EU need to be both aware and able to participate.

Risk: As shown through Current participation data in H2020 and across events shows skewed participation to small number of local authorities (roughly 10%) which could be due to lack of awareness or specific barriers to participation faced by the others.

Opportunity: Since almost all relevant EU programmes (see below) acknowledge the importance of local authority as a user group, the new multi-annual financial framework could be the opportunity to seek concrete measures and funding specifically aimed at involving Local Authorities and their planners in information, Innovation and training actions around Spatial Data.

About the Thematic and Geographic Availability of Data Resources?

Many national and regional agencies across the EU are already involved in providing underlying services and data collections on which local authorities planners rely to run digital applications relevant to their work. (See for examples, the applications described in the section below).

Risk: regional or national ground schemes are unevenly developed across the EU which means that some local authorities can be blocked from duplicating or extending those applications to their territories because the enabling baseline components and resources are not available in the region or country to which they belong.

Opportunity: EU level cooperation funding available through such instrument as *Interreg* could be mobilised to step in to fill a gap. This is especially important for mapping purposes that are clearly trans-border matters such as transport and environment.

What Impact Will National Legal Frameworks and Administrative Practices have?

Legal frameworks at EU or national level rending Digitisation mandatory help by creating a level playing field and ensuring the general application of common standards which greatly helps data-reuse. This is shown by the examples the Spanish law on digital real-estate data or the eReporting introduced by the inspire directive. On the other hand, the French case of the local authorities exceptions to the implementing of 2016 framework law on digitalisation of public services and the German case of federal legislation applying to It security for utilities infrastructures, both illustrate the challenge of applying contradictory objectives of different legislations applying to data.

Risk: Local authorities embracing digitalisation will be increasingly confronted to the challenges of addressing legal requirements of privacy and security of data.

Opportunity: The mid-term review of the Digital Single Market Strategy and the coming review of the PSI directive (see below) are one opportunity to comprehensively address these contradictions at EU level. In the short term, the eGovernment action plan may also represent one avenue to enable concerns from local authorities to be brought directly to the attention of all MS authorities involved.

Who Trains the Local Decision Makers?

Finally, one obvious part of ensuring that EU cities make full use of all these new opportunities to expand digital planning is to bring them to the attention of Mayors and City Councils across the EU. As the many project results and solutions presented the INSPIRE 2017 event have shown, the topic of Digital Planning is now mature enough to be relevant to many more than the technical and academic experts who have been involved in making it happen.

Opportunity: Several major associations of mayors exist across the EU which could serve to bring and disseminate these results at a major event or through road shows.

3. Most Relevant European Legislation and Programmes

Ongoing Mid-Term review of the Digital Single Market strategy

The digital single market strategy is the set of EU level legislation and policy framing much of the developments described above. The mid-term review is ongoing for the DSM strategy adopted in 2015.

As stated at the Inspire 2017 event, last September: "As part of the follow-up of the mid-term review of the Digital Single Market Strategy the Commission is currently exploring how public sector bodies could significantly improve their decision making if they were able to use commercially-held information, notably for the purpose of public health policy, spatial and urban planning, natural and technological risk management, managing energy supply grids or protecting the environment."

A related issue is the coming review of the **Public Sector Information (PSI) Directive** due in 2018.

To find the documents: http://eur-lex.europa.eu/content/news/digital_market.html
Who to speak to at the European Commission: Eddy Hartog, Head of Unit, DG Connect H1
What association follows on behalf of EU Cities: Eurocities

The INSPIRE Directive and related actions

The INSPIRE Directive aims to create a European Union spatial data infrastructure for the purposes of EU environmental policies and policies or activities which may have an impact on the environment. This European Spatial Data Infrastructure will enable the sharing of environmental spatial information among public sector organisations, facilitate public access to spatial information across Europe and assist in policy-making across boundaries. INSPIRE is based on the infrastructures for spatial information established and operated by the Member States of the European Union. The Directive addresses 34 spatial data themes needed for environmental applications. The Directive came into force on 15 May 2007 and will be implemented in various stages, **with full implementation required by 2021.**

For more on all related activities see: https://inspire.ec.europa.eu/

Copernicus

Copernicus is a European Union Programme aimed at developing European information services based on satellite Earth Observation and in situ (non-space) data. The Programme is coordinated and managed by the European Commission. It is implemented in partnership with the Member States, the European Space Agency (ESA), and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the European Centre for Medium-Range Weather Forecasts (ECMWF), EU Agencies and Mercator Océan. Vast amounts of global data from satellites and from ground-based, airborne and seaborne measurement systems are being used to provide information to help service providers, public authorities and other international organisations improve the quality of life for the citizens of Europe. The information services provided are freely and openly accessible to its users.

For more on all related activities, see: http://www.copernicus.eu/

ISA

The ISA² programme supports the development of digital solutions that enable public administrations, businesses and citizens in Europe to benefit from interoperable cross-border and cross-sector public services. ISA² is running from 1 January 2016 until 31 December 2020. The programme was adopted in November 2015 by the European Parliament and the Council of European Union.

For more on all related activities, see: https://ec.europa.eu/isa2/isa2_en

4. Practical Applications for Local Authorities

Comprehensive Digitalisation Of Urban Planning In Spain

A 2015 Spanish law makes digitalisation mandatory using the INSPIRE GML standard: As one of the most comprehensive efforts of Digital Planning in the EU, Spain now has a new legal frame (law 13/2015) mandating digital coordination between the Cadastre and Property Rights Registry that give real estate traffic greater legal certainty by incorporating the georeferenced graphic information of the parcels in the Property Rights Registry. In order to register a building in the Property Rights Registry, the geo-reference of its position is also required by the law 13/2015. Citizens, Businesses involved in real-estate and the territorial public authorities all have

the duty to communicate to the Cadastre land consolidations, reparcelling, administrative demarcation, expropriation and acts of urban planning and urban management data using INSPIRE GML. ***The law has been in force for two years with more than 8 million of certificates download by users***, all of them with the INSPIRE GML attached. The result is a fluid and safe exchange of information between all the agents involved in the real estate trade. It has also led to the development of applications, products and services by private initiatives. GML file is now well known by surveyors, engineers, architect, notaries, register workers, etc. and it has become the standard in cartography exchange. The adoption of INSPIRE GML standard for Geographical data of Cadastral Parcel and Buildings is a key part of the future e-government approach since it will enhance interoperability and will enable the relation of real estate traffic and environmental policies in the future.

Source: ***The Spanish Cadastre and Property Rights Registry: a smart model of coordinated interaction***

Smart Cadastral Applications for Real-Estate Appraisal in Polish Municipality

One method for enhancing property valuation models consists in determining zones of an urban municipality – **Wroclaw** - in which the prices of residential premises change similarly over time. Such similar zones are then merged into bigger areas embracing greater number of sales transactions which constitute a more reliable basis to construct accurate property valuation models. This is especially important when machine learning algorithms are employed do create prediction models. A series of evaluation experiments was conducted using real-world data comprising the records of sales and purchase transactions of residential premises accomplished in a Polish urban municipality. Six machine learning algorithms available in the WEKA data mining system were employed to generate property valuation models. The study showed that the prediction models created over the merged cadastral regions outperformed in terms of accuracy the models based on initial component regions.

Source: ***https://link.springer.com/chapter/10.1007%2F978-3-319-24306-1_55***

Spatial information for urban planning and management in Zagreb

The City of **Zagreb** is involved in the establishment of a NSDI (National Spatial Data Infrastructure) in Croatia and actively provides inputs to Croatian NSDI. The management of official spatial information in Zagreb is orientated towards objectives of the city administration,

citizens and business sector. The City of Zagreb is also developing its own infrastructure on local level with City Geoportal, both desktop and mobile version, as central point for accessing data on city level, adjusted to specified users. The main driver for innovation and the most important user of spatial information in city administration is urban planning and management system, especially in spatial data integration, analysis, presentation and dissemination.

Source:

https://inspire.ec.europa.eu/sites/default/files/presentations/inspire_2017_Sisko_Cetl_Ciceli_.pdf

A Cadastre Conform 3D Building Model of Bavaria applied to High Speed Internet

The dataset of 3D-Building Models created in the federal states is assigned to annex III of the INSPIRE Directive for the data specification of buildings (INSPIRE-BU). In Germany the dataset of 3D-Building Models is created in two levels of detail, based on nationwide standards of the AdV. This work is done by the German federal states. In **Bavaria** the building ground plans are taken from the official cadastral map. The AdV and the Bavarian Agency for Digitisation have worked to each of their data set into formats aligned with those used or other INSPIRE data sets for 3D Building-Models as well as geometric and semantic data formats . Both models are based on the OGC-CityGML standard. The result was used to map the future layout and delivery needs for High-Speed Internet and detect Surveying errors. The technical support was provided by a team at TU Munich.

Source:

https://inspire.ec.europa.eu/sites/default/files/presentations/4_pdf_copy_of_presentation.pdf

Basque Country GISWASTE Project uses Digital Mapping to recycle organic waste

GISWASTE is an IT tool piloted by the **Basque Country** to help design recycling solutions for around 4 million tonnes of organic by-products and waste that the Basque country currently generates. Life GISWASTE is a local-level demo project which can be applied to any other European region which is struggling to manage its agrifood by-products. The aim is to develop a GIS-based methodology and IT tool which simulates the technical, economic, and environmental viability of the recovery alternatives for the agrifood by-products (chiefly vegetables, meat, and dairy products) in the Basque Autonomous Community. The recovery alternatives which are

evaluated in the Life GISWASTE project focus on two specific areas: biogas generation and animal feed production.

Source:

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4799

Digitalised Building Permissions in Hyvinkää, Finland, based on local and national spatial data infrastructure

Municipal authorities process many different types of permits concerning construction and communal areas. In Finland, building inspection units get over 1.5 million customer contacts and handle over 100 000 permits per year. Customers have usually visited municipalities' service desks and contacted them via phone and email. Applications and documents have been paper-based, and staff has had to enter information manually into their systems. Lupapiste (Permission Point) is a national web service that was jointly defined and developed by the Ministry of Environment, municipalities and a private company. Lupapiste gathers all parties working with construction-related permits at one web address and meets the diverse needs of citizens, municipal authorities, architects and other construction business experts.

Hyvinkää is an active city in the Southern Finland developed its own Spatial Data Infrastructure (SDI). Both city's own information systems and national systems can access all relevant spatial information from the SDI through INSPIRE WMS and WFS. In order to ensure the 24/7 availability of the spatial web services to all users Hyvinkää started to monitor their services already in 2014. Hyvinkää has been actively developing and piloting Lupapiste since 2013 and suggested a new functionality that enables real time use of all spatial information of the city. The functionality has now been implemented in Lupapiste. Today, 100% percent of the building permit applications come through Lupapiste. Based on the experience in Hyvinkää Lupapiste has made building permit processes much easier and faster. Good guidance through various application processes has really improved the quality of applications. No printed documents and visits to the service desk are needed anymore. The applicant can complement his application and the building inspector can admit the permission remotely 24/7 even from another country because all documents are digitally managed in the service. Lupapiste saves time for both the applicant and the city and the use has resulted at best to 90% faster processing times.

Source:

https://inspire.ec.europa.eu/sites/default/files/presentations/Hyvinkaa_SDI_presentation_Jaana_Makela.pdf

10 Years of Sustainable Smart City Management using Urban Geographical Information System in City of Kielce, Poland

The basis for setting the goals for **Kielce** was the Leipzig Charter on Sustainable European Cities. In 2006 Kielce City Council decided to build a system for sustainable urban development management using Geographical Information System. Now GIS in Kielce supports integrated city management. It comprehensively supports spatial economy, planning policy and zoning, performance management (indicators); authorising building permits of an investment, considering impact on environment. All the administrative proceedings related to spatial management and environment are constantly saved on digital map. Rom their decade of experience, the Kielce team assesses that Spatial data that is integrated from various sources is crucial to the entire system and is collected through the execution of procedures (including spatial plans), other systems: geodetic, accounting, census, unemployed register, specialised studies- LIDAR, oblique photos, 3Dcity model. They note that the feasibility of the entire project was heavily reliant on the ground work (formats, data collections, interoperability) generated by the INSPIRE directive.

Source:

https://inspire.ec.europa.eu/sites/default/files/presentations/SmartCity_Kielce_GIS_Szymon_Ciupa_v2.pdf

Single Data Infrastructure for several Smart City Projects in Hamburg

In January 2015, the City of **Hamburg** has adopted a Digital City Strategy. The objective of Hamburg is to exploit technical innovations to advance the development of Hamburg as a “digital city” and to create the conditions for a climate of innovation that promotes the development of modern digital applications and to improve the networking between the firms and institutions involved. Hamburg is city partner in several large European smart city projects with broad range of topics such as participation, transparency, mobility, environment and security. All these projects are related to the single Urban Platform of the City of Hamburg which

is a conceptual approach that aims to connect existing and future IT systems and services so that they not only know each other and share data, but also communicate logically and analytically in interactive processes to inform, prepare and assist in decision making.

Source:

https://inspire.ec.europa.eu/sites/default/files/presentations/2017_09_07_SmartCity_Projects_INSPIRE-Conference_Schubbe16to9.pdf

Crowd sourced and Citizen Science

BerlinMinecraft project: the project makes Berlin 3D and other Open Data available in the world most played game Minecraft, supporting young people to play in near-real world settings and participate in town planning (citizen engagement). The model was used in 3 social projects and competitions so far

Other Projects – Crowdsourcing Mobility Data conducted in Germany by OSIRIS and enviroCar projects involved making citizen to collaborate using Geo Open Government Data (citizen science, crowed sourcing).

Source: https://inspire.ec.europa.eu/events/conferences/inspire_2017/submissions/302.html

5. Useful Links

Digital Single Market

EU 2017 Countries eGovernment Factsheets | Joinup

Digital Single Market: Open Data in European cities - Recommendations for the Sustainability of Open Data Portals in Cities

eGovernment_in_EU_June_2017

eGovernment4EU - FUTURIUM - European Commission

Digital Single Market: Open Data in Europe - Dashboard

EU Digital scoreboard 2017

EU Science Hub - European Commission - Dataset from the JRC PREDICT study ongoing since 2006

Inspire

INSPIRE Geoportal

INSPIRE Roadmap | INSPIRE

INSPIRE in Practice | INSPIRE

INSPIRE Forum

INSPIRE Data Specification on Cadastral Parcels – Technical Guidelines | INSPIRE

ISA

ISA2: The New European Interoperability Framework

ISA: Sharing and Reuse Framework for IT Solutions

ISA² Core Vocabularies poster

european-interoperability-architecture-eia-leaflet_en.

european_interoperability_timeline

isa2 programme presentation

Infographic: NEW EUROPEAN INTEROPERABILITY FRAMEWORK

EUROSTAT

Factsheet on Urban Europe - statistics on cities, towns and suburbs - executive summary - Statistics Explained

Factsheet on Population and Housing Census Legislation - Eurostat

CensusHub2

Eurostat - Tercet: Harmonising Territorial Typologies

Copernicus

Copernicus -main site

Estimated Copernicus budget from EU and ESA since 2002 (in million €)

Copernicus: Securing the Copernicus programme: Why EU earth observation matters - Think Tank

Copernicus: The "DECUMANUS" R&D project contributes to the evolution of Copernicus Land Monitoring service

European Commission to launch major Copernicus User and Market Uptake initiatives

The Value of Copernicus - Geoffs Blog - EARSC and OGEO Portal: Bringing EO user communities together.

Copernicus: Securing the Copernicus programme Why EU earth observation matters

New era in air-quality monitoring a step away

Copernicus and Big Data: Challenges and Opportunities

Copernicus: Space Market Uptake in Europe - Think Tank

Copernicus: Securing the Copernicus programme Why EU earth observation matters