Digital Planning: a time of change

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18 April 2021

Data science and digitalisation has become a priority across different fields and different sectors. While acknowledging that there has been major progress in the development of techniques and methods in certain fields such as engineering and transport; there is a clear lag in the wider policy application and decision-making field, including spatial planning. The digital overhaul promised in the Planning White Paper is premised on the idea that planning practice relies on outdated systems and tools that reduce the speed and quality of decision-making. Therefore, the government proposes that digitalising planning services, with democratisation of data and better technology, will lead to better solutions and improved community engagement. This assumption neglects the fact that many local planning authorities have very limited human, financial and technical capacities to make the transformation. Also, planning itself is a politically charged activity which has to balance different interests and competing demands. Our discussion is strongly driven from a spatial planning perspective to identify opportunities and challenges to move towards digital planning in a more grounded approach.

What should digital planning look like?

The reasons that we want to further digitalise the planning system is to improve the quality, transparency, and speed of decision-making on spatial planning matters. Digital technology provides innovative tools for planners to coordinate complex and competing policy needs across different communities and sectors. Mapping and visualisation of spatial information could enhance public participation and engagement. Urban modelling can provide effective planning- and decision-support tools for policy scenario evaluation. An integrative, automated and user-friendly land use system has to be the foundation of digital planning that can provide an ongoing update of land use change and seamlessly connect to other key national databases.

Some barriers and challenges

The main barriers to achieve digital planning are the lack of financial resources, technical skills gap and poor data infrastructure of local authorities. Although the government stipulates that the new digital planning service system will be funded by its beneficiaries (e.g. landowners and developers), there is not a clear strategy on how this actually will work in practice - who is going to foot the upfront cost of setting the system up, including training local authority officials. The private sector is keen to develop new commercial products, which may not serve the public sector and planning well due to the high cost of data access.

Spatial information is complex, especially with multi-scalar data, the need to establish consistent spatial data standard is an urgent task. Location-aware technologies are already transforming health, housing, environment and transport services and the recently established Geospatial Commission aims to help businesses better use of location data produced by public bodies such as OS to contribute to the geospatial economy. Our understanding is that INSPIRE (for EU) and the OS is working on the spatial data standard and the UK Data Standards Authority has already been working on establishing standards to make it easier and more effective to share and use data across government.

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There is also the issue of choosing appropriate and compatible tools in the procurement of local government, linked to the knowledge and skill gaps of planning practitioners in digital planning. Previous experience of adopting GIS in local authorities exposed the lack of coordination of procurement of software and hardware across different departments and thus affecting data sharing.

The aptitude and literacy of data science, digital technology and policy interpretation of planners and other key actors would be critical to whether the quality of planning outcomes can be enhanced with the prospect of digital planning.

How to improve our spatial data infrastructure?

(1) Publish all spatial planning policies (current, proposed etc) as Web Map Services following a national meta-data standard (e.g. via EU Inspire directive which LAs already use and OGC standards).
- No plans should be in PDF, for example, Portugal has a national information territory information system, built upon the EU's INSPIRE standard, where plans of all scales (neighbourhood, municipal, national or sectorial) have to be submitted in electronic format (https://www.dgterritorio.gov.pt/ordenamento/sgt/igt-vigor).
- Written polices to be published following a national xml schema format.
- Standard set of land use / policy colour schemes, so everyone knows what each colour represents. We led the world on this in the 1950s! For example, in Germany all local plans and zoning plans have to use the same colour scheme (http://www.dr-frank-schroeter.de/planzv.htm#Anlage)
- The Digital Land team at MHCLG has already been working on some of these proposals to help unlock land and housing data's potential for everyone involved in land and housing development.

(2) Create a genuine national land use database, not just a brownfield land one. There were once plans for such a comprehensive database in the early 1990s, before they resorted to only have the NLUD-PDL (National Land Use Database for Previously Developed Land). This was then abandoned after 2010, with the last published version from 2012. The UK Digimap has a land use database to provide baseline data, but it is a commercial product with restrictive access.

The current brownfield registers only partly follow the old NLUD concept, as sites are only included where housing development could be possible. In practice they are often simply revamped/updated versions of the SHLAA (Strategic Housing Land Availability Assessment) to register sites (some with polygons). It relies on local authorities to conduct basic surveys for basic mapping updates. It is quite a labour-intensive task to maintain and update and only 75% to 80% coverage is achieved.

(3) A Spatial Planning and Management Information System that can be used by planners to manage the planning process, from publishing plans digitally, managing development applications to informing the public and enabling the public to make inputs on development applications and engage with other processes. Essentially, a system that caters for the needs of planners, decision-makers, developers and the public. The access portals for planning applications in many planning authorities are not very user friendly and are often separated from the local plan system. If England moves towards some form of zoning, then these would need to be better integrated, particularly when large scale (outline) planning applications de-facto provide a masterplan for entire neighbourhoods. Some use alternative systems, for example, Wandsworth in London, have integrated the policy map with live planning applications (https://maps.wandsworth.gov.uk/).

Upskilling planners and building capacity with planning authorities

There is a need to upskill all professional planners with the basic literacy to adapt to the new environment of digital planning. It is important to avoid the schism of having one or two specialists in the workplace while others are illiterate of the digital environment. The RTPI needs to revise its expectation of basic level of professional competence in the light of digital planning. There is a need to redesign RTPI's own learning modules for CPD and with online tests along the lines of the European Computer Driving Licence as a part of CPD etc.

There is a clear need to have more on the job training for planners, especially as the training budget of local authorities tends to be very limited for planning staff. After the shift from the former 2-year master programme to an intensive one-year programme, the problem is that it is unclear what continuous training these graduates received afterward, especially in relation to digital skills. If the government is serious about pushing the digital agenda on planning, then MHCLG should fund training – online and/or in person. The development of digital training centres for local planning officers and other professionals in the way of CPD would be a way forward. Our own experience of doing distance learning at the University of Manchester is that it requires a lot of preparation time and universities can only help to do this if there is full economic costing to allow us to employ dedicated staff to develop online training modules in a professional manner and to provide quality online support.

In terms of capacity building of the spatial data infrastructure for planning, planning schools (together with their colleagues in maths and computer science) can collaborate with local authorities. To make the collaboration work, understanding the spatial context and issues are very important, as a lot of reflexive practice knowledge is needed to validate the robustness of the data and the algorithms used for pattern and image recognition and machine learning. The idea is to help local authorities to develop a digital strategy for spatial planning by identifying priorities to update their information systems and to look for good practice and more cost-efficient ways of doing things. These include:

- Digital planning and decision support literacy
- Vocabulary standardisation
- AI application in spatial data infrastructure development
- Co-production and open source (e.g. via GitHub)
- The development of 3D spatial data portal

This also touches upon whether Level Service Agreements can be negotiated for the licensing of certain software and datasets. It would be useful to know what services PlanTech and PropTech companies are providing to local authorities in terms of virtual reality, big data analysis, and machine learning technology etc.

A time of change: reforming planning curriculum and education

Our own experience in Manchester is that we have relatively more staff capacity than others in delivering teaching on GIS, spatial analysis, spatial policy monitoring and the development of decision support toolkits over the last 10 years. More recently, working with other departments in the university, we have developed a one-year MSc in Data Science with an Applied Urban Analytics pathway which is attracting high calibre students. We do include spatial elements in the teaching, but it is a very science-oriented degree and the entry requirements are very demanding in terms of competence in computing, mathematics and statistics skills. In our view, this route will produce specialists on the technical side, but not fulfil the objectives of mainstreaming data science and digital technologies in our planning education.

We therefore have to step up our game on teaching digital and analytical skills of our planning graduates to raise their basic professional competence in these areas. For UG education, there is a need to plan and map out different skills and levels of learning conducive to digital competence and by introducing more integrative applied projects. Given the Master's degrees

are one year programmes, in theory, the curriculum can be updated very swiftly. However, the scope to introduce more advanced skills in the 12-month generic postgraduate masters planning programmes is very limited. This is partly because there are too much core content and skills to be covered for RTPI accreditation and partly because students come from very diverse backgrounds with usually low skills in GIS (for example, many UK Geography undergraduates only use GIS to do simple choropleth mapping). We also strongly argue that the strengthening of further training is also needed for students in specialist master's degrees (e.g. urban design and real estate).

Whilst there is a need to strengthen the foundation training, for those who have a keen interest, we propose to introduce a second postgraduate year involving more advanced applied training through real life projects and internships. This would differ from the Data Science masters by having a strong focus on spatial planning, with data science and digital technology as tools for planning analysis and decision-making. This type of advance master's degree should also provide a pathway for students to apply for (1+3) ESRC studentships for doctoral degree. In order to attract planning students to specialise further, there has to be incentives such as good career prospects with higher earning propensity in the longer term and, more importantly, to have attractive bursaries to fund this extra year of study (e.g. from the government / MHCLG).

In terms of the basic level of digital literacy, based on our current teaching experience, here are some suggestions on what is required:

(1) Better measuring planning outcomes with new / more data, new technologies (e.g. sensors, 3D spatial analysis and visualisation), new methods (big data analytics) and a good grasp of spatial geographies;
(2) Use of open-source software and coding languages in order to free codes and algorithms from 'black boxes' (i.e. propriety software);
(3) Further integrate digital planning tools / methods in the modules we teach (for examples, in 'Neighbourhood Planning', we ask students to write their assignments on Esri StoryMaps and make use of interactive maps; in 'Decision Support Systems in Planning' students use agent-based modelling to design and test urban policies and GeoDesign to design urban interventions);
(4) Develop an inclusive agenda so that no social groups (e.g. older people, disabled people, etc.) are left behind in the digital planning agenda;
(5) work closely with PlanTech and PropTech companies to harness new digital infrastructure and emerging technologies such as artificial intelligence and machine learning, virtual / augmented reality, 5G, etc.; and
(6) Free licencing for university staff training of special software.

How to develop our research capacity to enhance the agenda?

At the national level, research councils have various initiatives that encourage universities working with government departments, the OS and ONS etc. The UKRI is in the process of developing a digital strategy and has strongly encouraged the linking of data science and AI to improve our computing capacity and linked this to address the net zero carbon emission requirements.

As far as spatial planning is concerned, we do feel that a more decentralised and contextualised approach of capacity building is needed. Even if there is a national hub of research excellence, there is a need to have more regional spokes to help local authorities to build up their capacity. The Turing Institute Urban Analytics programme can be a vehicle for this knowledge exchange with local government if planning schools have a bigger integration in the programme. There is also a need to have a more bottom-up approach to establish local policy needs and applications. This echoes our earlier point about linking planning schools and their computer science colleagues to collaborate with local authorities to develop data infrastructure and digital capacity.