Digital participation: taking 'planning' into the third dimension

Stephen Marshall**, **Andrew Hudson-Smith, David Farndon and Athanasios Kourniotis
outline recent experiments in digital participation in planning.

Figure 1. Screenshot of 3D model of a courtyard at Pollards Hill, south London, featuring a user-generated design.

The plan is the original two-dimensional visualisation technology, and the traditional cornerstone of town planning. While the town plan was always susceptible to the criticism of being rather 'two dimensional', its degree of abstraction also became associated with professionals' design and interpretation of places, handing a certain power of agency to the planner.

But this perspective is increasingly changing, with the rise of three-dimensional visualisation and the 'online consultation revolution'[1]. Information can now be visualised, communicated and manipulated at any location, any place, at any time, as long as we have the political, cultural, and economic means that gives us access to the relevant technologies. These technologies are on the edge of a new revolution in our ability to design, communicate and plan at a distance. With the advent of 3D modelling, virtual and augmented reality, technology is increasingly being used to help break down barriers between the professional

and the lay public, allowing not only richer visualisation, but immersive experience of urban landscapes and proposed developments.

This has an enticing potential to connect better with the public, that could boost the ability and even desire for the public to participate in the planning system.

In this article we report on developments in digital planning, with experience from a recent research project Incubators of Public Spaces, involving the experimental application of 3D modelling as part of an online platform for public participation in a London housing estate. We briefly outline the online platform, and its extension into virtual and augmented reality, and some user feedback from practitioners, before concluding on future prospects.

The Incubators platform

A glimpse of a possible future has been trialled in a recent applied research project, *Incubators of Public Spaces*[2]. This involved the development and application of innovative 3D modelling software with an online design platform. The core technology was created by project partners in Torino and Graz, and developed for application to the Pollards Hill housing estate in south London with researchers at University College London in collaboration with Moat housing management company.

This system allowed local users to manipulate design interventions in a 3D model of a housing courtyard, and to share these online for comment and further development. The platform allows users to view the site from ground level, 'fly' over and around the site, and to pan, tilt and zoom the view, and select and configure design interventions such as seats, landscape features, leisure facilities, and so on (Figure 1).

In effect, the Incubators system presented Pollards Hills users with a premade model, constructed by experts from an architectural drawing. Additional options were predesigned and added via a drag and drop style interface using a propriety tool. The production process to make use of such models is still complex, involving the development of a 3D model, the integration into a viewing platform with suitable levels of interaction and finally the integration of collaboration and communication tools (visual and textual). The main interface in Pollards Hills was browser based, providing what could be described as a basic level of three dimensional interaction, certainly below a level required to provide a detailed view of the environment. It provided a simplistic bird's eye view with the use of components linked to a costing and placement rule set.

The platform was launched for a public experimental test phase in August 2017, made available to the residents of the courtyards, a local school, and also some selected professionals for feedback. The test phase allowed the project team to gain valuable insights into the potential use of the system, concerning user access rights, input formats, user design capabilities and the level of detail suitable for sharing community co-design ideas. While the platform was found to be readily usable by local participants who signed up to the system, it remains to be seen how such a system could be integrated with the overall planning process.

Beyond the Virtual: Augmenting Reality

The team also considered the possibilities of enhancements using Virtual or Augmented Reality. As Michael Batty and Andrew Hudson-Smith pointed out more than a decade ago[3], VR (virtual reality) systems tend to be specialist in the environments they create and, until the widespread use of holographic devices linked to personal computer and TV, they will always remain the domain of expert users. This has remained true until arguably the release of the Oculus Go in May 2018, providing a low cost (under £199), interactive VR device that provides high quality graphic output and collaborative interaction.

The ability to interact with designs within a three dimensional space, rather than a browser, provides a unique insight into the future of online planning. As pictured in Figure 2, the 3D model of the Pollards Hill courtyard was ported into the Microsoft Holo Lens system, allowing a point and click interface while the model 'floats' in front of the user in actual space.

Real-time, remote and co-located collaboration are key elements to the experiential design review process in SketchUp Viewer[4]. With multiple HoloLens devices, a group of users can load the same model, engaging a "see what I see" collaboration mode. Remote collaborators can communicate via real-time audio and use mixed-reality visualization 'sight-guides' to better understand who in the group is looking at what. This would seem to become important when applying to the practice of engaging groups of users, in a context where town planning or urban design becomes a collaborative, potentially social activity.

While providing basic visuals within the browser platform, the Incubators core software (Figure 1) did benefit from ease of interaction in terms of the formulation of designs. Conversely, whilst the augmented reality provided by HoloLens (Figure 2) did offer a superior visual experience, it was limited in terms of stakeholder design interaction and discussion features. The future of 3D visualisation and participation tools will see the interaction of the desirable elements of both of these approaches.

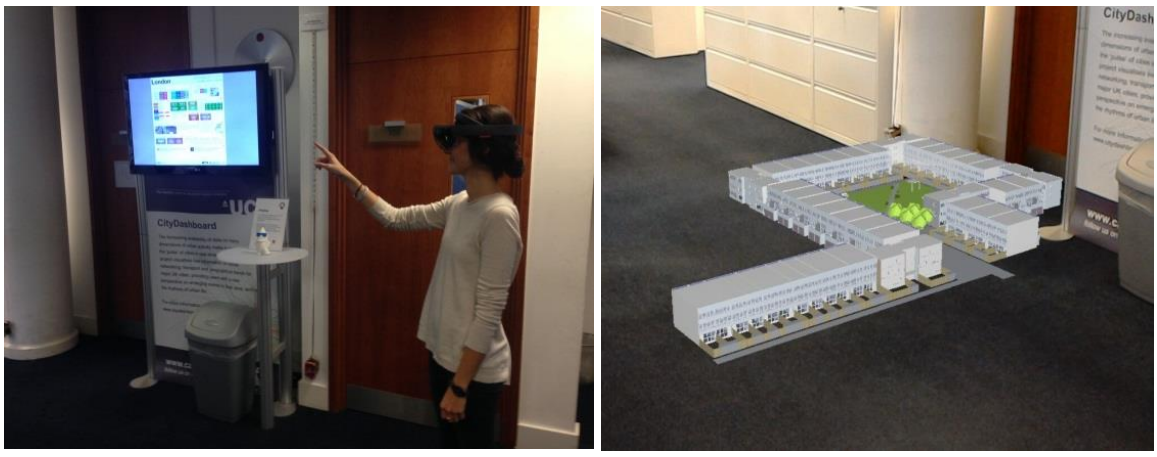

Figure 2. Viewing the Pollards Hill housing estate in Augmented Reality, via HoloLens (a) A user wearing the HoloLens; (b) the view of the courtyard model, hovering as if in space in front of the viewer.

Practice perspectives

From our initial discussion with practitioners, we believe that this kind of software has every prospect of helping engage with the public. According to Stefan Webb of the Future Cities Catapult, the opportunities of digitization are improved transparency, potentially superior accuracy in plan design, and an enhanced understanding of the planning process through greater engagement.

To maximise utility, such digital tools need to have high quality and fidelity, both with respect to how the model visualises what is on the ground, and also how it builds in any real-world constraints such as cost of elements. While an individual application may be promising, the start-up cost for a digital tool can be high, and there is a potentially high cost in translating a digital tool from one location to the next. In effect, systems ideally need to be replicable, and be able to make use of open data.

From a planner's perspective, Colin Haylock (practitioner and former President of the Royal Town Planning Institute) felt that the tool could help prompt conversation, with the planner as professional facilitator. That is, even if such digital tools are not used directly as a detailed design input by lay people, the availability of a 3D visualisation provides a vehicle for engagement: "I could see with the tool how you might actually manipulate a discussion where you have people with first responses – 'We want the place to do this. There are the bits and pieces we want' – and then you have the second stage of conversation on how this applies to microclimatic terms. For example, if you want to have a street café and you are sitting out; do want to be sitting in the sun, or prefer to be sheltered? What time of the day you might be doing this? From this you can see how a conversation might unfold. I can see how you can actually help people make more sensible choices, because you can very quickly respond to their initial thinking and then interrogate that further and adapt as the conversation unfolds".

Meanwhile, Ioanna Rossi of Kingston University sees the potential of digital tools in engaging with younger people – via smartphones and tablets as well as conventional computers – but also emphasised the importance of having a parallel process of engagement, traditional as well as digital, to avoid excluding anyone else: "There will still be the need for door to door leaflets, public venue events and [to] get closer to the community in more direct ways if you want to do a proper consultation."

So, it looks as if – for this reason alone – two-dimensional paper plans will be with us for the foreseeable future.

Future prospects

The use of three-dimensional design visualisation, coupled with discussion and voting within an online environment is a mere glimpse at the potential of digital planning. There is however a long way to go. The process of building, displaying, communicating and allowing the addition of rule based three dimensional planning is still challenging. Pollards Hill can be noted as an early insight and future developments will allow a smoother interaction and take

the concept into the VR/AR realm. The Pollards Hill experimentation also highlights the need for a longer term, arguably open, platform for allowing three dimensional public consultation. Open source, rapid capture and multi-model online public consultation could be the way forward but this remains in the realms of development. The Incubators experiment at Pollards Hill provided a glimpse into the possible.

From a planners' perspective, the future possibilities of digital participation need to be widely understood with regard to how it can be used to create and appraise development, as well as how its attributes may generate interest and purposeful engagement amongst stakeholders. So the challenges that the implementation of digital participation tools face in public participation need to be explored with prudence. This will hopefully occur as interaction with such technologies increases but the stubborn problems of participation, particularly around the ability of communities to engage and exert meaningful influence, will need to be addressed in order to ensure that such technology truly empowers citizens, avoiding problems of raised expectations and the disconnect between local residents and planners.[5]

There is also a need to consider the point in the planning process such tools could best be implemented (e.g. during preliminary consultation; pre-application discussions; at the formal assessment and determination stage); and the scale at which they are used (e.g. for delineating minor streetscape improvements; to envisage new development massing, to detail a neighbourhood plan including land uses). Again, the expectations of the process need to be identified at the outset so to avoid disenchantment amongst stakeholders.

Lastly, planners need to understand how digital participation can enable interests to coalesce around a development vision. This ultimately requires stakeholder 'buy-in' whereby planning and development professionals, both in the public and private sector, facilitate digital participation and embody the viewpoints expressed in development plans. This is not readily achieved given that democratic processes are inherently open to political and economic influence and constraints, but the ability to more fluidly communicate using digital participation provides an opportunity to make planning more directly informed by, and responsive to, the desires of citizens.

It is clear that there is no 'one size fits all' approach to digital participation and that ongoing experimentation of different formats is necessary to suit diverse circumstances. The potential of new, alternative ways of 'planning' beckons, going beyond simply replicating existing plan-based processes in digital form. That said, digital participation must fit with the planning system it is to operate in, and in a sense can only be as effective as that context allows. But within that context, it offers new tools – and a new dimension – for planners to exploit. ■

● ***Stephen Marshall*** *is Professor of Urban Morphology and Urban Design at the Bartlett School of Planning, UCL;* ***Andrew Hudson-Smith*** *is Professor of Digital Urban Systems at the Bartlett Centre of Advanced Spatial Analysis, UCL;* ***David Farndon*** *is a Research*

Project Officer at Queensland University of Technology; ***Athanasios Kourniotis*** *is Associate Director at Wood plc. The opinions expressed are the authors' own.*

Notes

[1] P. Norton: 'Changing forms of consultation'. *Town & Country Planning*, 2018, Vol. 87, Feb., 71-76

[2] The Incubators of Public Spaces project ran from October 2014 to September 2017 and was a collaboration between UCL (University College London), Politecnico di Torino, Katholieke Universiteit Leuven (KUL), Innovation Service Network GmbH, Neurovation GmbH, and the City of Turin. The Incubators project was funded through JPI Urban Europe, with specific funding for UCL's work provided by the UK's Economic and Social Research Council (ESRC) Grant ref: ES/M008495/1. The project team are grateful to Marian Burke and her team at Moat for their assistance at Pollards Hill; and to Oliver Dawkins of CASA for importing the model into the Hololens System.
. Further information about the project can be found on the Incubators website: https://incubators-of-public-spaces.com/

[3] M. Batty, A. Hudson-Smith: 'Digital cornucopias: changing conceptions of the virtual city', 2006, *Environment and Planning B*, 33 (6) 799 - 802.

[4] https://www.neowin.net/news/sketchup-aims-to-transform-industrial-design-using-holograms-with-new-microsoft-hololens-app

[5] This echoes some of the traditional challenges of local neighbourhood planning – see for example, G. Smith: 'Neighbourhood planning – promising more than it can deliver?'. *Town & Country Planning*, 2018, Vol. 87, Jan., 28-30.