MOBILISNG DIGITAL ENABLERS FOR CITIZEN ENGAGEMNT IN URBAN REGENERATION

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ABSTRACT

The smart city has come to signify the application of digitalisation in urban development. The strong attention and resources devoted to developing smart cities are, however, paralleled by hurdles and setbacks. Issues arise due to, e.g., the dominating influence of narrow expertise and/or vested interests. A voluminous literature points to challenges in meeting with citizens' needs, and/or lacking requirements for achieving relevance in addressing fundamental challenges in urban development, such as fragmentation, polarisation, and under-representation by disadvantaged groups. During the recent on-set of COVID-19, increased benefits of digital communication blend with new concerns and drawbacks, such as fatigue, risk of conformity, and mismatch between technical requirements and user skills.

Such issues inspire other models for urban development, including eco-cities and inclusive cities, and place focus on avenues for spurring broad-based benefits, such as Nature-Based Solutions (NBS). Drawing on the H2020 project URBiNAT, this paper revisits the rationale for applying 'digital enablers' to both deepen and broadening citizen participation, identifying four critical building blocks: purpose, method, content, and tools. Their practical application may benefit from leveraging constructive "Communities-of-Interest" pursued in parallel across interlinked cities, operating in sync with awareness creation and measures on the demand side, while minimising the presence of downsides. It concludes with recommendations of relevance to cities as well as stakeholders and research, linked to observations of next stage operationalisation in support of continued learning processes and practical lessons of high general validity.

KEYWORDS

INTRODUCTION

As Information and Communications Technology (ICT) has come to permeate most strands of economic and social life over the past half-century, the concept of digitalisation has been applied to refer to the ubiquitous, seamless conversion of data into a digital format. The upgrading of business models, organisational change and scope for innovation have been the epicentre for much of the associated literature. Extending from there, however, today digitalisation refers to a far-reaching systemic societal transformation, accompanying the utilisation of ever-increasing amounts of digitised data, turned into intelligence and actionable knowledge (cf. Castells, 2010).

The scope for new initiative and innovative activity emerging with digitalisation is paramount in urban development. The key flagship for this movement has been the "smart city" concept. Numerous cities adopted smart city agendas which have been described and examined by a wealth of research studies. Much attention has been devoted to sectoral approaches and specific technologies (Hölscher et al., 2019). Business development and innovations ensuring market-friendly and commercially viable outputs similarly feature regularly. Gradually, however, questions have arisen regarding focus and orientation (Hollands, 2008). Attention has been drawn to downsides, e.g., excessive focus on high-tech and favouring of vested interests. Some point to tendencies of breeding a culture of unheralded acceptance of influences by narrow expertise and/or vested interests (Swyngedouw 2007; Vanolo, 2014).

The interlinkages between economic, social and environmental aspects have gained traction (Souter and McLean, 2012; Digital Europe, 2019). Contemporary urban development keeps struggling with institutional, political, and administrative impediments, while battling a host of inter-related challenges spanning, e.g., resource waste, carbon footprints, fragmentation, polarisation, and exclusion (Filion et al., (2015). In this context, other connotations are gaining ground, e.g., Eco-cities, or Green and Inclusive cities, signalling shifting priorities but also needs of communication. Human behaviours as well as realising well-being and sustainability have emerged as a central theme rather than an after-through in urban strategy formulation.

Properly managed, smart devices widen the scope for engaging citizens on outstanding issues as well as for working out, implementing, and monitoring solutions (Brabham, 2009; Gabrys, 2014; Brorström et al., 2018). With the on-set of COVID-19 in the last few years, use of digital communication became critical as a means for disseminating information to citizens, while also a source of relief and breeding ground for social initiatives. At the same time, previously well-known issues, e.g., risk of fatigue, conformity, and mismatch between technical requirements and user skills, lingered (Picazo-Vela et al., 2012; Gordon and Mihailidis, 2016; Andersson et al., 2021*a*).

The idea that improved access to ICT for disadvantaged groups by itself serves as an equalizer, fell flat many years ago (Azari and Pick, 2005), reflecting the wider debacle on the subject of *digital divide*. ICT has clearly alleviated many social disparities, associated with affordability, safety, and lack of access to service (Rice and Katz, 2003; Castells et al., 2007), while other gaps - in knowledge opportunity and income – have widened (OECD, 2001; Joss, 2018).

Whether labelled smart cities, eco-cities, or in other ways, urban development remains relatively weakly informed of the means for pursuing urban regeneration through broadened participation (Shipley and Utz, 2012). On this basis, the present paper contributes to the literature by taking a closer look at the requirements for putting digitalisation to work in urban regeneration through support of co-creation, notably related to NBS and Healthy Corridors, while staying clear of the downsides. In this, we draw on the ongoing work of URBiNAT, a Horizon 2020 project that engages seven cities in the EU, as well as some outside the EU, aiming for structured experimentation and learning processes of practical relevance to governance mechanisms for more inclusive and prosperous city development.

The paper is structured with the ensuing section providing a brief introduction to the definitions and key features of the smart city agenda. This is followed by observations what is actually new, with emphasis placed on the scope for deepened as well as broadened citizen participation. Examining digital enablers as a means in this context, the paper reviews four main building blocks, links to Communities of Interest, awareness creation and measures on the demand side. It is further underlined that the implementation of digital enablers requires consideration to limiting the downsides. The paper ends with recommendations and conclusions.

THE SMART CITY AGENDA

A vast literature considers the means of leveraging the value of digitized data and processes through business model development and organisational change. The scope and impacts of digitalisation are highly diverse, however, as is discernible at varying levels of aggregation, spanning individuals, communities, cities, regions, national states, and so on. Yet, what role ICT plays is complex and the ultimate significance in terms of productivity, quality of life and societal progress, remains evasive.

More than perhaps anywhere else, this complexity is apparent in the context of urban development, where the concept of "smart" cities has become widely associated with ICT and digitalisation (Angelidou, 2015). A range of definitions exist, of course, spanning drivers vs. outcomes, with consideration to organisational factors and spatial features (Yigitcanlar et al., 2018; Lim and Maglio, 2018; OECD, 2020). The scope and novelty of technical applications generally keep weighing heavily: smart sensors, the Internet-of-Things (IoT), deep-learning algorithms and Artificial Intelligence (AI) managed through smart brains, or "orchestrators" collecting, processing and distributing big data (Ahad et al., 2020; Said and Tolba, 2021). Many entail elements of service and product innovation (Walker, 2013).

Smart city applications have been extensively mapped in Europe (Melville et al., 2013) as well as more broadly across the world (Lee et al., 2014; Appio et al., 2019). According to (Duygan et al., 2021), a strong presence of services in the local economy, of universities, and high population density makes urban areas conducive to the adoption of smart city strategies, whereas the size of the city, rate of new residential development or linkages to international networks play less of a role. More fundamentally, however, what activities, and which cities, can be denoted as "smart", and why does it matter?

An extensive literature observes that the smart city concept continues to be applied loosely (Vanolo, 2014; Meijer and Bolívar, 2016) with multiple connotations to it. Technologies, people, infrastructure, buildings, amenities, and transport may be termed "smart". Generally, outputs are framed as infrastructure or municipal services that are more resource efficient and supportive of the well-being of citizens.

New means for two-way communication and interactivity are made possible through digitalisation. At the same time, it is implied that the smaller distance between citizens and city governance, compared to nation states, for instance, improve chances that digitalisation helps identify and respond to concrete issues. Yet, the linkages to and mechanisms realising citizen participation are generally referred to in vague terms.

In contrast to the allegations of success, many observers question the relevance of smart city initiatives for conditions on the ground, and the opportunities for most citizens to be heard (Falco and Kleinhans, 2018; Sánchez-Teba and Bermúdez-González, 2018). The critical importance of relevance, i.e., ability to address challenges that matter to the people living and working in the city, have arisen as a critical tenet.

WHAT IS "NEW"?

Institutions tend to evolve along trajectories marked by strong path-dependency, driven by established competencies and vested interests (Wolfram, 2016). In presenting smart city agendas, as noted, governments and urban administrations tend to highlight spectacular applications of new technology. Examples grabbing attention at the present time include "industry 4.0", IoT, and AI.

From early on, sectoral ambitions featured strongly in smart cities, applying to, e.g., transport and mobility, energy, waste, health services, or tourism. Private sector development encapsulating investment, often realised through public-private-partnership (PPP), is key to mobilising investment and speedy roll-out, while also viewed as key to engaging first-rate competencies, achieving efficiency, productivity, customer-relevance, and fuelling innovation (Scuotto et al., 2016; Deloitte, 2018).

As a flip-side, the smart city agenda is struggling to escape impressions that technical advance and commerce are promoted at the expense of other voices and aspirations. Warnings have been raised against inflicting a culture of conformity, a sheltered space unaccompanied by critical reflection (Swyngedouw, 2007; Catney, and Doyle, 2011). Further, with one-sided rush for novelty, technologies new today will be obsolete and replaced tomorrow, implicating continuous disruption and costs (Saxe, 2019).

This begs the question, what is truly new here? Movements for urban transformation claiming "new" impetus on the urban environment and urban life, have clearly arisen before. In fact, recurrent waves of "modernism" occurred in cities since well before the Roman era (Cugurullo 2018). Generally, though, they were driven by government motives, representing a "supply push", i.e., authorities or solution providers extending new or revised offers to citizens.

Whether the smart city revolution turns out to be any different remains to be seen. The nature of its roots, as closely linked to digitisation, however, does offer the prospect of realising radically different elements. In fact, the general nature of the crux is clear. Technology does not deliver by itself, and government is not an end. Outcomes depend critically on purposes, including how they are formed, by whom, and whether in the presence of inclusion.

Digitalisation, and the rise of the smart city, is therefore potentially different from the novelties of the past. Its true promise does not reside in the enhanced muscle of government to inform citizens, but rather boils down to unique capacity to propel interactivity, among a broadened range of citizens. Unless the resulting momentum is reigned in, controlled, and manipulated, digitalisation brings the scope for deepening as well as broadening citizen participation.

Although the rise of "smart citizens" – at least as perceived by administrators - displays far less of a convincing record in terms of effective representation by citizens in key decision-making, compared to the influence of experts and business, an increasing number of policymakers, not least at city-level, are becoming genuinely convinced that constructive citizen engagement is both desirable and feasible.

It has been argued that playgrounds are made possible for "[…] counter-discourses through a wider discursive engagement of citizens in the development of the smart city" (Grossi and Pianezzi, 2017, p. 84). Many claim efforts of creating an environment that is open to "[…] practicing user-driven innovation for experimenting and validating Future Internet-enabled services" (Shaffers et al., 2011, p 444).

A related development is the emergence and up-take of new concepts – of Eco-cities or Green cities –placing emphasis on environmental and ecological aspects. There is also the notion of Inclusive Cities, spelling out that citizens, not technologies or businesses, are taking centre stage.

DIGITAL ENABLERS

Today, multiple smart city initiatives placed strong emphasis on developing and applying digital enablers as means to massively enhance citizen participation. For digitalisation to support better and more relevant solutions, however, rather than merely informing citizens – those who live and spend their days in the city need to be granted not just the opportunity, but also the ability to take part in identifying the issues as well as the efforts to work out solutions (Greenfield, 2013; Calzada and Cobo, 2015; Mosannenzadeh et al., 2017).

This development is highly visible in the particular sphere of European projects focusing on NBS, i.e., solutions making use of nature and ecosystem services in support of wide-spread economic, social, and environmental benefits (Maes and Jacobs, 2015). Significant resources have been devoted in recent years to enabling active participation by citizens in processes framing and delivering NBS. The results of the rich empirical experience around have been extensively reflected on in a rapidly expanding literature. While various positive outcomes have been observed, most quality with observations of various conditions exerting important influence on what is possible (Renn and Schweizer, 2009; Burton and Mustelin, 2013; Mees et al., 2015; Cattino and Reckien, 2021). Some observe limited value, and even conclude that counter-productive practices tend to dominate and outright hamper sustainable outcomes (Waylen et al., 2015; Mees et al., 2019; Wamsler et al., 2020).

Despite the critical importance of the subject of participation, relatively little attention has been paid to ways forward to craft strategies and operational tool-boxes for promoting constructive broad-based engagement. To fill this gap, the URBiNAT project has set out to devise, test, evaluate, and draw lessons from co-creation of NBS, and their extension to Healthy corridors. Particular focus is placed on deprived areas and engaging marginalised groups –"unusual suspects" who tend to stay on the side-lines. Here, our focus is on how to apply digitalisation in this context.

If operating in isolation, communication using digital tools may have little to offer on such matters. Unresponsible power structures and communication channels coupled with the prevailing dominance of incumbent competencies and interests, as set out above, may impede any significant progress. Given that digital tools can be embedded in comprehensive vehicles, however, specifically devised to support participation, we enter a totally different space. Building the required functionality, we argue, takes at least for four kinds of building blocks; purpose, method, content, and tools (Andersson, 2021*a*). With "digital enablers" we refer to synchronised packaging and usage of these four elements, where each is tailored to specific situations and users (cf. Figure 1). Critically, methodologies and content should be suited to fulfilling specific purposes, while using the most suitable digital tools applied by the targeted local subjects.

Combinations of building blocks are considered in Andersson (2021*a*), along with observations of results achieved under varying circumstances. Separately, Andersson (2021*b*), devises novel applications, selected through close consultation with local task forces featuring citizens in selected study areas of the URBiNAT cities. These applications relate to the portfolio of NBS introduced for deployment in the project, and also their combined more aggregate constructs experimented with to shape Healthy Corridors, with the aim of countering issues of fragmentation and polarisation in each city. In the next stage, further preparation, design, operationalising and assessment will be pursued in parallel across the interlinked cities, with all stages engaging targeted citizens in co-creation as a basis for a joint experimentation and learning process.

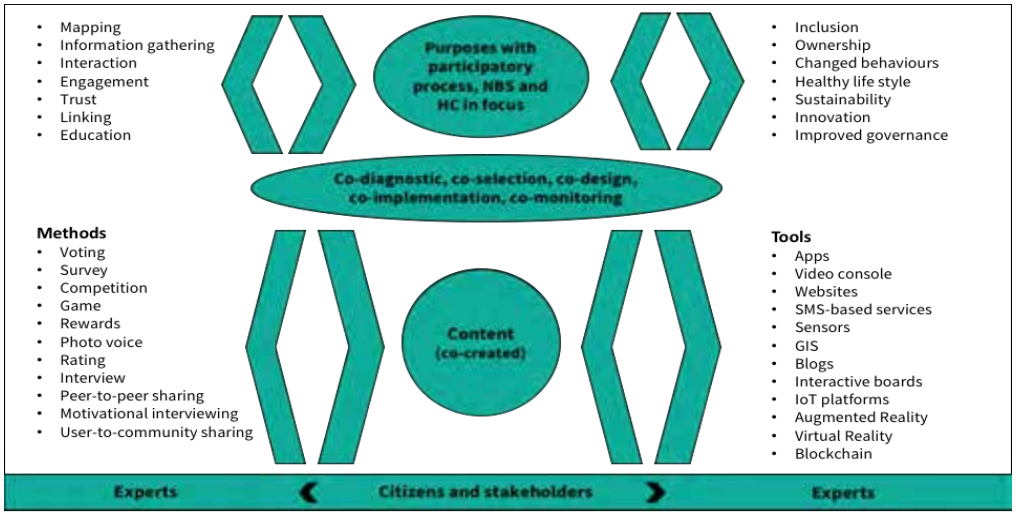

Figure 1: Building Blocks of Digital Enablers
Source: Andersson et al. (2021a)

VALUE-GENERATION

Adequately deployed, digital enablers add value, compared to other means of participation, due to specific advantages, or strengths, in effect the rationale for their application (Andersson et al., 2021*a*). These include speed, reach and precision when it comes to connecting with large numbers - and also with specific categories - of citizens and/or stakeholders. Notably, suitable methodology and content development offer great scope targeting and tailoring in this respect. Means of linking and strengthening bonds within sub-groups are similarly at hand. Here, so-called Communities of Interest (CoI), can be built upon and leveraged with a view to realising their shared specific interests.

In this, a challenges/solutions-driven approach should be distinguished from one that is identity/strength-based. With the former, focus is placed on bonding in response to common perceived threats, riding on shared fears and concerns. In the latter, positive connotations are picked up, e.g., arts, food, "green", gardening, or sports. When related to a particular neighbourhood, citizens may mobilise to fortify and upgrade them. Where coupled with enhanced measurement and trusted certification mechanisms, digital enablers may critically underpin enhanced demand for quality including "green" and socially responsible products and behaviours, strengthening support for sustainability through both market mechanisms and pressures on policymakers (McQuaid et al., 2021).

When blended with strong elements of awareness creation, digital enablers may instigate and grow "latent" identities and bonding. Tensions reduced as a consequence may lay new ground for collaboration and compromise among troubled segments of society. On a related note, digital enablers have proven uniquely equipped to introduce operational means of growing collaborative networks (Guerrero et al., 2015; de Vries et al., 2018). Dialogue and cooperation promoted within local communities can serve to reduce dependency on government (URBACT, 2019). A fundamental contribution here is to shift mindset from a narrow "what is in it for me?", to discover "what is in it for us?" Coming into play are design methods and the framing of participatory processes that operate at community, or group level, with social relations awarded strong attention (Nam and Pardo, 2011). Albino et al., (2015) recommend "integrated approaches" which include both "hard" aspects – technology-based, material compensation – and "soft" (social) rewards.

The relationship between citizens and scientists/experts raises contentious issues, which have been the subject of extensive scrutiny for the purpose of working out solutions to complex decision-making surrounding sustainability and climate change. Participatory practices may deflect attention away from profound, long-term considerations. The need of managing uncertainty and intricate systems aspects inevitably leads participatory approaches into heavy working practices (Hassenforder et al. 2015). Especially when confronted with high-stake issues, boundary lines between facts, values and politics are troubled by the role of media and manipulation by vested interests, as examined by Herman and Chomsky (1988) among others.

With traditional means of collecting and evaluating factual information compromised, the question here is what countermeasures, if any, can be crafted through the application of digital enablers. Digital enablers are surely not a panacea for overcoming risks that warnings by scientists and experts go unheeded, as is evident from the explosion of misinformation and manipulation processed through social media. News coverage in many countries around the world has been reduced to short-form, shallow messaging, benefitting narrow commercial interests and, in some cases, leading to the rise of autocratic regimes.

Going back to Healy (1999), however, extended peer communities are of high importance for establishing trust. Online communication vastly expands the speed and efficiency with which this can be achieved, if properly addressed. This may pave the way for constructive peer-processes and exchanges on terms that facilitate compromise. In essence, digital enablers can be applied to bring about mechanisms for broad-based quality assurance of scientific inputs to policy, operating through 'extended peer community' involving citizens at multiple levels while also linking to daily life (Renn and Schweizer, 2009).

Digital enablers can be mobilised in support of improved governance in other respects. Depending on their usage and context, digital enablers may compel local, regional and national authorities to be more transparent and efficient, including when it comes to consultations with citizens and diverse interest groups. The scope for co-creation procedures and the management of public space relates to polycentric governance, taking on board a spectrum of stakeholders. Digital enablers can be framed to support favourable synergies between collaborative governance models (Zingraff-Hamed et al., 2020) and also to cope with influences of multi-level governance (Homsy, 2019).

Digital enablers come with downsides too. Examples include risks of data misuse, privacy violation, proprietary vendors – exploited for elevating populist agendas, or campaigns of influence based on one-sided perspectives, "cherry-picking" benefits readily at hand. Many bottom-up initiatives, emanating from citizens, are trapped by freely available, mainstream social media channels, such as Facebook or Instagram. Gains in terms of accessibility and convenience are extensively compromised by issues of data misuse, privacy violation, and user manipulation (Saad-Sulonen and Horelli, 2017). By contrast, use of platforms that run on open systems, avoiding dependency on proprietary vendors, require substantive effort, investment, and development work, possibly including support by experts in ICT, at least in the short term. On the other hand, the latter put users in control of their own data and development, leaving them less vulnerable to commercial exploitation and with greater development potential. National and local authorities generally lean towards the former, however, explicitly or implicitly playing into their hands.

These conditions underpin the need of safeguards for protecting privacy, enabling adequate authentication and authorisation of IT systems, the rule of law, and civic rights. Innovations have brought some remedial action, including new forms of "digital counselling", some by the private sector and others by local communities building competencies and promoting measures supporting safety online. Yet, more is required to frame mechanisms for greater control by citizens of personal identities and data (Andersson, 2008; Andersson et al., 2013; Kitchin and Dodge, 2019; Ismagilova, 2020).

RECOMMENDATIONS AND CONCLUDING REMARKS

Taking stock of the challenges invoked by the smart city agenda, this paper focuses on digital enablers in support of citizen engagement and co-creation. The literature is caught in a peculiar trap between a heavy shift in public communication spelling out high ambitions in realising shared governance, and a largely sceptical literature pointing to scanty evidence of positive impacts, and even negative outcomes.

Urban development is marked by relatively few levels separating decision makers and citizens. Against this backdrop, we argue that the willingness and capability of city governance to confront the issues and improve the practices for constructive citizen engagement have in fact shifted from a side-affair to becoming a watershed factor, a defining tenet for smart city designers, as well as urban planners more broadly.

Having said that, governance structured remain plagued by a host of issues. Protective administrative silos tend to underpin traditionally separated centres of power, often demarcated along obsolete divisions of sectoral responsibilities, each marked by their dominant set of incumbent competencies while linked to relevant sets of special interest. Realising tangible progress calls for organisational change and a shift in approach to furthering professional competencies representing diverse perspectives, by way of scientific discipline as well as in terms of practical experience and citizen representation (Wolfram, 2016).

We further observe that digital enablers carry great potential to both deepen and broadening citizen participation. Relatively little attention has been devoted to this capacity thus far, however, and particularly how to operationalise it on the ground. In this paper, we have outlined the scope for embedding digital tools in broader packages of building blocks, while also taking advantage of accumulated experience entailing, e.g.:

- Place emphasis on inclusion and countering conflicting interests, crafting tailored approaches based on thorough local diagnostic, guiding the selection of digital tools carefully fitted with purposes, methodology and content;
- Frame the conditions required for active participation by citizens from the start, with the terms of co-creation consistent and credible over time. In URBiNAT, each of the stages associated with co-diagnostic, co-design, co-implementation and co-monitoring, have been identified as key;
- Ownership by citizens, coupled with accountability, of high priority, relating to both problems and solutions made possible through the application of digital enablers.
- Methods for participation representing a spectrum of well-established engagement practices, such as motivational interviewing, photo voice and focus groups.

On this basis, preparations are under way by URBiNAT for the implementation of selected digital enablers, specifically devoted to frame co-creation that is inclusive of citizens who traditionally were left out. Particular value will emanate from this work being pursued in parallel across interlinked cities, operating in sync with awareness creation and measures on the demand side. Further novel efforts are called for to work out effective ways of mutually strengthening market forces and amending governance structures to include citizen participation on terms that allow for improved quality decisions.

The means of applying digital enablers to help realise more constructive collaboration between experts/scientists and citizens require greater attention and should be actively pursued and seriously evaluated in support of gradual but tangible progress. In framing and running digital enablers, opportunities should be sought to confront the presence of conflicting interests, such as those related to cross-sectoral or cross-border effects.

The present paper calls attention to the great scope that reside in digital enablers for furthering the shift from a traditional Smart-City technology to digital solutions driven by citizens and other stakeholders for advancing and realising the full Eco-city development. This is partly due to the potential role of digital enablers in balancing distributional impacts. For this to be realised, however, adequate and relevant competencies need to be developed, in sync with adjusted strategies and governance mechanisms required for applying digital enablers to both deepen and broadening active co-creation among citizens.

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