Article

Phygitally Smarter? A Critically Pragmatic Agenda for Smarter Engagement in British Planning and Beyond

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Abstract

In Britain as elsewhere, planning systems are entering a "digital turn." However, the emerging conversations around PlanTech in policy, industry, and research yield contrasting views about the promises of digital technology and "data-driven" decisions to enhance and embed public participation in the planning system. With faster, data-driven processes capable of engaging more people in more diverse ways, PlanTech offers to revolutionise planning systems. However, empirical evidence demonstrates low citizen trust in government and web-based technologies, democratic and participatory deficits, the complexity of the planning system and its opaque technocratic terminology, multi-layered digital divides, and other socio-technical factors that hinder effective and inclusive public consultations in planning. This article provides a preliminary, high-level research agenda for public consultations across Britain's three nations that centres around a critical pragmatic design, deployment, and evaluation of blended/"phygital" (simultaneously physical and digital) information-rich ecologies of smart engagement. A review of selected national policy in Britain provides initial insight into the emphasis (or lack of) put on the adoption of digital tools within the planning process of each British nation. In doing so, the research sets out a conceptual model that complements existing models for participatory planning by adopting Beyon-Davies' unified conception of information, systems, and technology. The conceptual model presented sets out seven Is of information-rich phygital ecologies and three interdependent "pillars" for smart engagement that enable one to gaze both deeply and broadly into opportunities for smart engagement through and beyond PlanTech.

Issue

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1. Introduction

Across Britain as elsewhere, national planning policy encourages a "digital-first" approach to public participation, underpinned by a digital overhaul and a long-standing, continuous reform of the planning system. A chief aim of the current digital revolution is to optimise the delivery of public services by increasing the speed of planning processes and decisions, with a focus on data rather than the current focus on documents (Batty & Yang, 2022; Parker et al., 2018; Wilson & Tewdwr-Jones,

2022). Toward this end, digital engagement is promoted as a means of reaching more people in more diverse ways to integrate citizen input. The overarching aim is to facilitate better and faster processes that lead to "data-driven" decisions and resource optimisation. Notwithstanding, there are clear challenges for such a digital planning system to be simultaneously *effective* (delivering high-quality development in an inclusive, sustainable way) and *efficient* (optimising public value and the speed of delivery through faster decisions). We characterise the current trend toward digital-first

participation to support data-driven decisions as a some-what narrow form of "smart engagement." Even as digital innovation for public consultations continues to unfold through a wide array of digital methods, neither the national policy guidance nor the academic literature seems to provide any clear definition of what "smart engagement" might be or the way in which digital participation can indeed lead to smarter, better decisions. Rather than seeking scholarly terminological consensus, a critical pragmatic definition would help act on the fact that digital engagement does not a priori lead to better or smarter decisions, and that the complex underpinning factors that do, such as structural conditions that shape access to and the use of digital technologies may call for more radical innovation in the way public consultations are conducted in the current information age of "digital-first" (cf. Commonplace, 2021; Holmes & Burgess, 2022; Royal Town Planning Institute [RTPI], 2020).

Reconceptualising "smart engagement" from a critical pragmatic perspective enables one to convey its potential to better translate data into meaningful knowledge and transactional activities by way of information-rich and "phygital" (simultaneously physical and digital) ecologies. The term "phygital" seems to have been initially coined in the 2010s to describe the rise of e-retail as a complement to in-store shopping practices (Shi et al., 2020). In the realm of community involvement in planning, the practice of engaging citizens in different complementary ways has benefitted from international experimentation and good practice. Current trends in phygital engagement can in part be attributed to the growth in the diversity of both physical and digital engagement technologies, including the historical evolution of mental maps into community GIS and various forms of geoparticipation and 3D participatory modelling (Hjerpe et al., 2018; Pánek, 2016). One can also cite the pioneering work of planning consultancies such as Spacescape in Sweden, or Repérage Urbain in France, among many others, that have creatively combined such in-person methods as exhibition stalls, participatory workshops, and/or site visits with online map-based surveys, which enable information-rich methods such as sociotope mapping (a map-based approach that combines residents' knowledge with the expertise of town planners, urban sociologists, and ecologists; Babelon, 2021; Douay & Prévot, 2015; Rantanen & Kahila, 2009; Ståhle, 2006).

By undertaking an integrative review of academic and industry literature and selected national planning policy across Britain, this article provides an updated narrative around smarter engagement in planning to recontextualise the meaningful translation of data into decisions via human judgement and knowledge. Importantly, the article also addresses the social and ethical challenges with a digital-first approach. Based on the above, we propose a conceptual model for effective smart engagement that adapts the unified conception of information, systems, and technology by Beynon-Davies

(2010) to help convey the way in which data and information become simultaneously utilised in and shaped by social activities. The conceptual model is targeted at reflective practitioners, policy-makers, researchers, and activists who wish to identify pragmatic solutions to the observed challenges that a digital-first approach to engagement poses, all the while maintaining a cold, critical look at real, long-term opportunities to do so in a context of continuous planning policy reform.

The article begins by setting out the methodology for the study, before providing a state-of-the-art critical discussion around smart engagement in planning, the issues of concern with a digital-first approach, and a review of principal planning policy documents for each of the three British nations.

2. Methodology

This article provides a conceptual model based on an integrative review of academic and industry literature and a review of high-level British national planning policies (Table 1) that shape opportunities for public consultations. For the academic and industry literature, this study adopted a consistent analysis to identify and present a state-of-the-art discussion of "smart engagement" in planning, while also addressing the social and ethical challenges in a "digital-first" approach. The integrative literature review approach we adopted synthesises and engages critically with key substantive issues in a consistent though non-systematic way to develop a conceptual framework or typology (Snyder, 2019). Potential articles relating to the topics of this study (digital planning, public consultation, digital technologies, etc.) were identified through a scan of existing databases based on these keywords. In doing so, additional keywords and associated terms employed in the initially reviewed literature, relating to the topics of this study were established and used to further search the literature. The approach identified that the term "public consultation" was used interchangeably within the reviewed literature with related terms such as "community engagement," "citizen involvement," "community collaboration," and "public participation," as well as a combination of these terms, amongst others. Likewise, digital technologies for engagement have been referred to as digital participatory platforms (Falco & Kleinhans, 2018), online participatory technologies (Afzalan & Muller, 2018), web-based engagement portals, PlanTech, digital planning, and other tools that facilitate community engagement for data-driven solutions. This exercise highlighted the interchangeability and diversity of terms used within this domain, which itself was mirrored within the reviewed policy documents, and heightens our observation of a lack of any consensual understanding of smart engagement in digital planning.

To further support the proposition of a conceptual model and gain insight into the acknowledgement of

smart engagement within the context of Britain, current, high-level planning policies for each of the three nations (Scotland, England, and Wales) were reviewed. Although produced by distinct national governments, all three planning systems are plan-led and prioritise decisions "in the presumption of sustainable development" through plan-making and development management. The policies selected were the most recent key publications for each country in relation to their national planning policies, allowing for an up-to-date overview of whether and how these discuss aspects of "smart" engagement, as a way to complement the findings established from the integrative literature review. Table 1 provides a descriptive overview of the reviewed policy documents, including their salient features.

3. Smart Engagement in Planning

In Britain as elsewhere, national planning policy encourages a digital-first approach to public participation, underpinned by a digital overhaul of the planning system, as part of a wider context of e-government (Batty & Yang, 2022; Wilson & Tewdwr-Jones, 2022). Concurrently, the practice of public consultations has integrated advances in web 2.0 and 3.0 technologies that have introduced interactive capabilities and analytics, respectively (Anttiroiko, 2021). The stated aim is to enable smarter, data-driven decisions that ensure real community needs are met and thereby avoid emotion-driven or unevidenced judgement in both policy-making and development management (Ministry of Housing, Communities & Local Government, 2020). Depending on the planning context and design quality of the participatory process, commonly mentioned benefits of digital engagement *can* include improved efficiencies in planning processes, and engaging more people in more creative, diverse, and interactive ways in both real-time and asynchronous ways than is typically possible in more traditional, in-person, and paper-based alternatives. Careful consideration of a wide range of socio-technical design parameters (e.g., demographic, organisational, democratic, budgetary, information flow) can therefore help improve the effectiveness of digital engagement and supporting analogue methods as part of an elaborate socio-technical framework (Babelon, 2021; De Filippi & Cocina, 2022; Gil, 2020). The cost of engagement per individual has also been reported as potentially lower for digital public participation than for more "physical" means (Commonplace, 2021; Kahila & Kyttä, 2009). As such, digital engagement technologies, if well designed and managed, promise to provide greater inclusion, creativity and diversity in terms of participants and types of input, such as in delivering co-production and other collaborative forms of policy-making and service delivery (Fung, 2015; Kleinhans et al., 2021). Across Britain, there is a push in national policy to supply more development at pace and of higher quality, alongside key digital, built, and natural infrastructure, except without

Table 1. High-level national planning policy guidance documents that identify opportunities for public consultations.

Policy document	Nation	Salient features
Draft of Scotland 2045: Our Fourth National Planning Framework (NPF4; Scottish Government, 2021)	Scotland	• Strong focus on inclusive placemaking, including region-wide strategies, cultural identity, digital infrastructure, and early engagement in planning
Transforming Places Together (TPT; Scottish Government, 2020)	Scotland	• Comprehensive and engaging policy document that provides a blueprint for a "world-class" integrated digital planning system for Scotland
National Planning Policy Framework (Ministry of Housing, Communities & Local Government, 2021)	England	• Fosters a more streamlined planning process and early engagement in planning for sustainable development
Planning for the Future (PfF; Ministry of Housing, Communities & Local Government, 2020)	England	• Strong focus on improving the efficiency of the planning system through digitisation, and open data to support faster decisions and citizen engagement in planning • Focus on upskilling the planning workforce
Planning Policy Wales (Welsh Government, 2021b)	Wales	• Strong focus on inclusive design, national and regional cultural identity, high-quality placemaking, and digital infrastructure to support businesses and individuals • Encourages early engagement in planning
Future Wales: The National Plan 2040 (Welsh Government, 2021a)	Wales	• Strong focus on regional development and placemaking through the planning system, including national and regional connectivity

the necessary budgets to deliver to expected standards (Parker et al., 2018). For example, a report by RTPI Scotland reveals that gross expenditure to local planning authorities across Scotland has been slashed by 38%, accompanied by a loss of 25% of planning department staff since 2010 (RTPI Scotland, 2022). Clifford (2020) and Wilson and Tewdwr-Jones (2022) indicate that over the last 20 years, resources for non-statutory public consultations have dwindled dramatically, thereby limiting the scope, nature, and diversity of forms of public participation in town planning that local planning authorities can realistically manage. Similar insight is echoed in research led by RTPI (e.g., Bicquelet-Lock & Taylor, 2020; Patterson-Waterston et al., 2020; RTPI Scotland, 2022). Interestingly, this is not to discount the growth over the last 10 years in the use the digital participatory platforms and other digital tools to engage residents across Britain as elsewhere (Babelon, 2021; Falco & Kleinhans, 2018; RTPI, 2020).

In a British context, statutory public participation primarily occurs at two separate though related levels. Citizen input in policymaking helps to shape strategic and local development plans, which in turn shape the criteria for making decisions on individual planning applications, from simple householder applications to large-scale major new development. In the latter, statutory public consultations provide opportunities for residents and stakeholders to comment on and submit "representations" about registered planning applications. Citizen input constitutes one of several essential sources of evidence for planning determination. The extent to which public participation actually shapes planning decisions is a complex, perennial question for which there are as many models for public participation as there are interrelated issues that warrant further investigation, beyond the scope of this article (Arnstein, 1969; Babelon, 2021; Flyvbjerg, 2002; Tewdwr-Jones & Allmendinger, 1998). Although an oversimplification, one can posit that two main positions exist that place public participation either as a means of fostering "consultative" exercises where planners seek feedback from residents without entering into any real dialogue, and, the alternative, more enthusiastic position that highlights the potential for greater "co-production" in policy design and implementation (Healey, 2012; Kleinhans et al., 2021). The debate remains open as to whether "citizen control" retains any currency for contemporary urban planning. The balance may at best point more toward collaboration on any of the many models used to design and evaluate the effectiveness of participatory processes, including their influence on planning processes, which also requires analysts to have a cold critical look at how consultations are effectively wielded by sponsoring organisations beyond the course of single projects (Arnstein, 1969; Carson, 2008; Davis & Andrew, 2018; Fung, 2015). There are dozens, if not hundreds, of models of public participation from which to choose concerning analogue and/or digital participation and different aspects of plan-

ning (see Babelon, 2021). However, these largely remain inscribed in just a handful of participatory planning paradigms that either acknowledge or simply disregard non-communicative and less-than-democratic decision-making practices in planning (Flyvbjerg, 2002; Lane, 2005; Rosol, 2015; Swyngedouw, 2005; Tewdwr-Jones & Allmendinger, 1998). Even studies that highlight the consultative role of digital participatory platforms warn of the risk of collecting feedback from citizens in a box-ticking statutory consultation exercise (Kahila-Tani et al., 2019).

Notwithstanding, the current state-of-the-art seems to lie in the deployment of phygital/blended approaches to engage residents, either *iteratively* (sequentially over time, in different phases of planning projects) or *recursively* (where the concurrent use of digital and in-person methods shape each other almost in real-time). Successful hybrid approaches aim to actively reach out to citizens with a genuine concern for diversity, linguistic barriers, democratic deficits, dwindling trust in local government affairs, and digital divides, among other limiting factors addressed in Section 4 (Nabatchi & Leighninger, 2015; RTPI, 2020). Interestingly, non-statutory consultation methods such as urban visioning or prospective consultations about aesthetic preferences can be the first effective step toward engaging residents to integrate citizen input in planning policies such as urban regeneration strategies, master planning, or design guidance (Deakin, 2012; Woods et al., 2019).

4. The Dark Side of Smart Engagement

In his seminal article entitled "The Dark Side of Planning," Flyvbjerg (1996) makes a cogent case for critical realism in planning that echoes other studies that underscore the prevalence of complex, dynamic governance processes. Such processes may appear as less-than-democratic to Habermas-inspired communicative planning advocates who view engagement as the conduct of fair, reasoned dialogue in search of the best common good (Allmendinger & Tewdwr-Jones, 2010; Tewdwr-Jones & Allmendinger, 1998). In Britain, national strategies for digital transformation have followed a digital-first narrative, reflecting the government's aspirations to accelerate economic growth, streamline public services, and become a world leader in digital adoption, notably in the related realms of construction and town planning and related reforms (Cabinet Office, 2020; Department for Digital, Culture, Media & Sport, 2022; Department for Levelling Up, Housing and Communities, 2022; Maltby, 2022). In the current policy-driven push toward digital transformation, critics warn that "blind faith" and optimism in digital technologies risk undermining democratic processes and decisions (Bernholz et al., 2021). At present, national strategies for digital transformation in planning take little account of the wider societal and economic implications of this increasingly rapid push for digital transformation, beyond addressing

digital divides as a matter of upskilling users and rolling out broadband (Holmes & Burgess, 2022). Critically, 1.5 million households across the UK do not have a broadband connection at home, and 21% of internet users have smartphone-only access, which has been shown to limit their access to essential digital-only services such as social housing applications (Holmes & Burgess, 2022; Ofcom, 2022). Unequal access to and use of digital technology and services came to the fore during the Covid-19 pandemic which further excluded already marginalised citizens (Robinson & Johnson, 2021). By extension, digital-first approaches promise to exclude just as much as in-person methods, precisely because they are different in nature and engage different people (Babelon, 2021; Pocewicz et al., 2012). The potential for exclusion has also been investigated by gender, age, race, ethnicity, digital skill, disability, education, and income and related effects of lack of and/or misrepresentations, biases, and unevenly distributed policy outcomes (Bricout et al., 2021; Holmes & Burgess, 2022).

There remain significant ethical risks associated with the exacerbation of existing exclusions, injustices, biases, and prejudices (Afzalan & Muller, 2018). With growing perceptions of digital participatory technologies as novel, exciting, and having limitless potential for more inclusive and efficient engagement, it is increasingly important that the ethical risks, inequalities, practical limitations, and cracks in the current planning system are brought to the forefront of debates around "smart" engagement (Airey & Doughty, 2020; Cardullo & Kitchin, 2019). Analysts warn that the current push in national policy toward systemic digital transformation displays several uncritical if not dysfunctional modus operandi that remain insufficiently addressed in both planning policy and practice (Boland et al., 2022). Such blind spots risk excluding groups of residents and types of engagement input, all the while compromising quality in the built environment, not to mention the risk of jeopardising the democratic imperatives of a well-functioning, equitable, and transparent planning system (Parker & Street, 2018; RTPI, 2020, 2021). These challenges concern: (a) a lack of organisational capacity and readiness at local planning authorities due to skills shortages and constrained budgets for non-statutory public participation, (b) the complexity of combined digital and participatory divides, and (c) low reported levels of citizen trust in government, developers, and the planning system (Batty & Yang, 2022; Boland et al., 2022; Clifford, 2018; Commonplace, 2021; Devlin, 2020; Wilson & Tewdwr-Jones, 2022). Besides, the planning system, both at the policy and development management levels, remains highly technical and unpredictable for all stakeholders involved, including residents (Commonplace, 2021). Most importantly, however, remains the commonly acknowledged (yet critically unassumed) fact that digital, in-person, and physical modes of engagement in public consultations provide unique, irreplaceable engagement "affordances." By their very nature, digital environments

such as web-based engagement portals provide a wide range of functionalities that simultaneously constrain and enable the diverse ways in which users interact with them (Kaptelinin & Nardi, 2012). The design of digital engagement technologies should cater for the needs and preferences of different user groups based on level of experience, age, and physical capacity, among other considerations, which can also be adequately considered through well-crafted, creative combinations of in-person and digital methods for engagement (Broberg et al., 2013; Gottwald et al., 2016; Nummi, 2018; Pocewicz et al., 2012; Young et al., 2021). While the need to adopt multiple modes of engagement is commonly acknowledged among planning and engagement professionals, the critical implication is that a dual, blended/phygital approach needs to be well designed, budgeted, and carried out with skill, coordination, and local sensibility to help deliver the best of both approaches and compensate for the worst of each.

Privacy and security risks are also key concerns for so-called "smart" participation, including issues around e-governance (Le Blanc, 2020), the ethics of algorithms and algorithmic decision-making (Tsamados et al., 2021), geoprivacy and geospatial ethics (EthicalGeo, 2021), among other issues. For example, the "self-learning" capacity of algorithms (in the case of neural networks) opens the way to unchecked governance risks as well as oversimplified, binary rule-based decision-making ill-suited for complex decision-making or accurate interpretation of nuanced comments from citizens (Boland et al., 2022; Daniel, 2022; Kitchin et al., 2019).

5. The National Planning Policy Across Britain

With the aim of identifying opportunities and challenges for phygital consultations in development management and policymaking, our research agenda takes stock of a selective list of high-level policy documents (presented in Table 1).

Of all the selected documents, the TPT for Scotland provides the most explicit discussion of how digital transformation can help optimise the planning system on the basis of evidence-based decisions and effective public participation, to improve the quality of places and public value. The TPT policy provides the most comprehensive and detailed strategy for digital planning among the reviewed policy documents. The notion of smart development and placemaking constitutes the red thread behind the TPT's vision. It builds on a backbone of digital technologies for data capture, place management, stakeholder engagement, and public participation. A peculiarity of the TPT is the recurrent use of the term "PlaceTech," which remains undefined but seems to refer to the comprehensive capture and utilisation of locational intelligence for urban analytics to inform planning decisions and foster a culture of digital innovation across local authorities. PlaceTech comes alongside an integrated suite of digital solutions built

around a single planning platform and open data portal. The context for smart engagement is centred around extensive data, information, technological interoperability, and new ways of working and collaborating with key stakeholders and the public. The TPT highlights that the Scottish Government is committed to supporting local planning authorities wishing to pursue smart engagement by providing them with licenses to the smart engagement platform PlaceBuilder, developed by a start-up through a national digital innovation incubator programme. However, in comparison to the clear focus and drive to adopt digital technologies to support planning processes discussed within the TPT, the NPF4 for Scotland mentions little more than the importance of modern digital infrastructure to enable such a comprehensive and integrated digital planning system.

In England, there is little mention of concepts relating to digital planning within the *National Planning Policy Framework*, with the only related mention of digital technologies in the planning process consisting of a single reference acknowledging the need that plans should be available through digital tools to support public engagement. In comparison, the PfF cites the term "PropTech" throughout and provides a clear call for the adoption of digital technologies and open data to make planning services more efficient, inclusive, and consistent, to modernise the planning process. The PfF promotes the need for a digital-first planning process driven by standardised and open data. In England, as well as Scotland, the policy documents, in conjunction with the work of bespoke departments and teams (e.g., the work of DLHUC Digital, Open Digital Planning and Local Digital) identify and set out a requirement to engage with tech and service design companies to develop innovative new approaches to boost efficiencies, improve user experience, and reduce errors and costs, while also supporting local planning authorities to use these innovations to support a new civic engagement process.

In Welsh policy, little mention is made of concepts related to digital planning, "smart engagement," or "PlanTech" beyond building a modern digital infrastructure and securing reliable broadband across the nation. Instead, the policies focus on the highest quality design and sustainable placemaking with community involvement and inclusion at its core, which constitutes a central substantive aim of the reviewed policy documents as well as that of other interlocking policy guidance. The Future Wales national plan cites strategic opportunities for North Wales to become a "smart, resilient and connected region," while the Planning Policy Wales notes the need to "embrace innovative technologies" in supporting several of its policies. However, unlike the reviewed policies for Scotland and England (TPT and PfF, respectively), there is no direct mention of the need to embrace digital technologies to improve citizen engagement and/or planning processes.

The main common denominator for the three nations is that planning is a plan-led system with the pre-sumption of sustainable development. All the reviewed policy documents place a strong focus on digital connectivity, well-designed places and buildings, and opportunities for all to thrive. Across the three nations, the policy address digital divides and exclusion by highlighting the need to improve digital skills and financial support for access to broadband and devices, as well as the value of providing services digitally to dispersed communities. For example, the NPF4 states: "Full benefits will be realised by actively tackling the digital divide by building skills, literacy and learning and addressing the financial barriers to internet access" (Scottish Government, 2021, p. 18). A backbone of digital infrastructure is also highlighted as fostering innovation and supporting businesses. Little mention is made of the more complex, structural effects of marginalisation that prevent many people from engaging effectively online or at all, as discussed here in the literature review. The policy also makes no mention of the need for information-rich ecologies of participation that provide both digital and physical/in-person methods to guarantee high-quality citizen input and improve the capacity for residents to engage in public consultations. The aim, rather, seems to align citizens' capacity with digital-first approaches, rather than the other way around.

Regarding data-driven decisions, the policy documents highlight the importance of collecting, analysing, and interpreting the evidence for specific plans and sites in light of the dynamic national planning policy orientations and community needs, particularly as regards housing supply, infrastructure, and, going forward, decarbonisation of the built environment and climate change adaptation. However, they provide different levels of focus relating to the adoption and application of digital planning tools and processes. Namely, TPT (Scotland) and the PfF (England) provide the strongest call for the need to adopt digital technologies in planning to improve efficiencies, cut costs, and support civic engagement, making direct reference to digital-first approaches and the need to capture and utilise data.

6. A Conceptual Model of Smart Engagement in Planning

Following the integrative literature review we propose a conceptual model that extends Beynon-Davies' (2010) unified conception of information, systems, and technology with seven Is of information-rich "phygital" ecologies, and three interdependent "pillars" for a smart, participatory digital planning system. Established as a result of the literature review, the conceptual model enables us to gaze both deeply and broadly into opportunities for smart engagement through, and beyond, PlanTech, as per the context.

As a result of the study presented, we suggest a heuristic definition of *smart engagement* as the process of involving well-informed residents in a well-resourced digital planning system by way of plural, collaborative

ecologies of participation to translate data into evidence-based decisions that shape and manage places sustainably. The conceptual model presented in Figure 1 elaborates on this definition, with the various parts discussed in greater detail below.

6.1. Beynon-Davies' Unified Conception of Information, Systems, and Technology

To recontextualise the potential for smart engagement to help improve planning processes and decisions in a critical, pragmatic way, we draw upon Beynon-Davies' (2010) unified conception of information, systems, and technology. In his seminal article, Beynon-Davies (2010) explores and extrapolates the relevance of communication artefacts used in the Inka Empire for modern information systems, particularly in reconceptualising the complex socio-technical conditions for meaningful interactions between people. In the proposed unified model, information is portrayed as the bridge between raw data grounded in the physical realm, and knowledge brought to life through social interactions in the activity realm. Information both structures the data from which it derives meaning and is structured by the activities for which this meaning (or "significance") is derived (i.e.,

"enacted"; Beynon-Davies, 2010). Beynon-Davies (2010, p. 390) writes:

> An information system is considered a special class of communication system, involving the use of signs within patterns of informative acts. As such, an information system is conceived of as a sociotechnical system that utilises a semi-formal "language" (Ågerfalk et al., 2006) mediating between activity systems on the one hand (social patterns of performative acts) and data systems on the other (technological patterns of formative acts).

The proposed framework by Beynon-Davies (Figure 2) is grounded in semiotics, or the study of meaning in social interaction. At its core lies the question: When do objects that act as signs become meaningful, and in which contexts? The Inkan communication coloured knitted threaded artefact studied by Beynon-Davies serves as the form (*forma*) which is both structured by information needs among people and provides the raw material from which communication can take place. For our purposes, the overall framework provides a conceptual basis for the design, conduct, and evaluation of public consultations that actively constitute ecologies of participation.
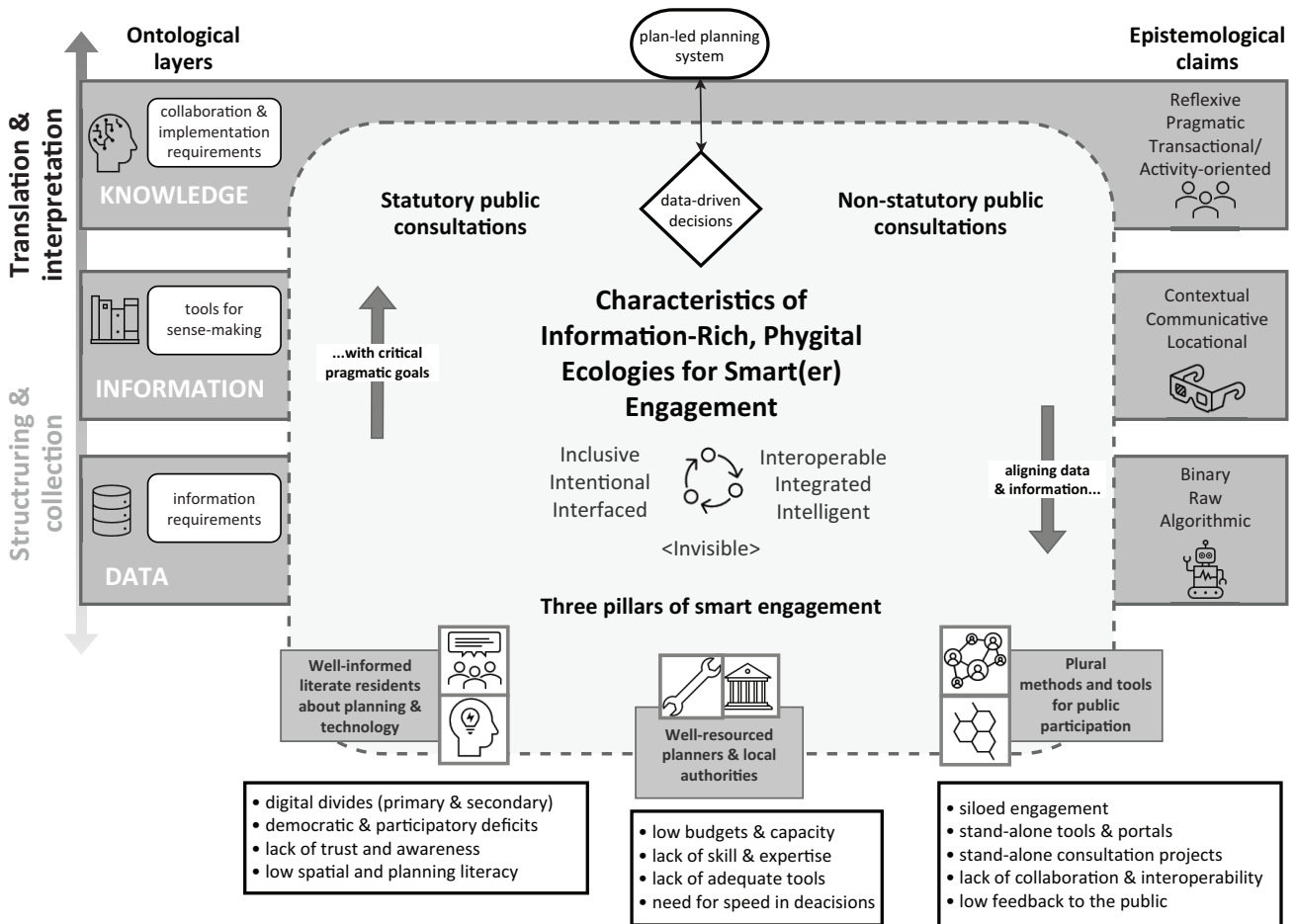

Figure 1. Original conceptual model for effective smart engagement in a digital planning system.
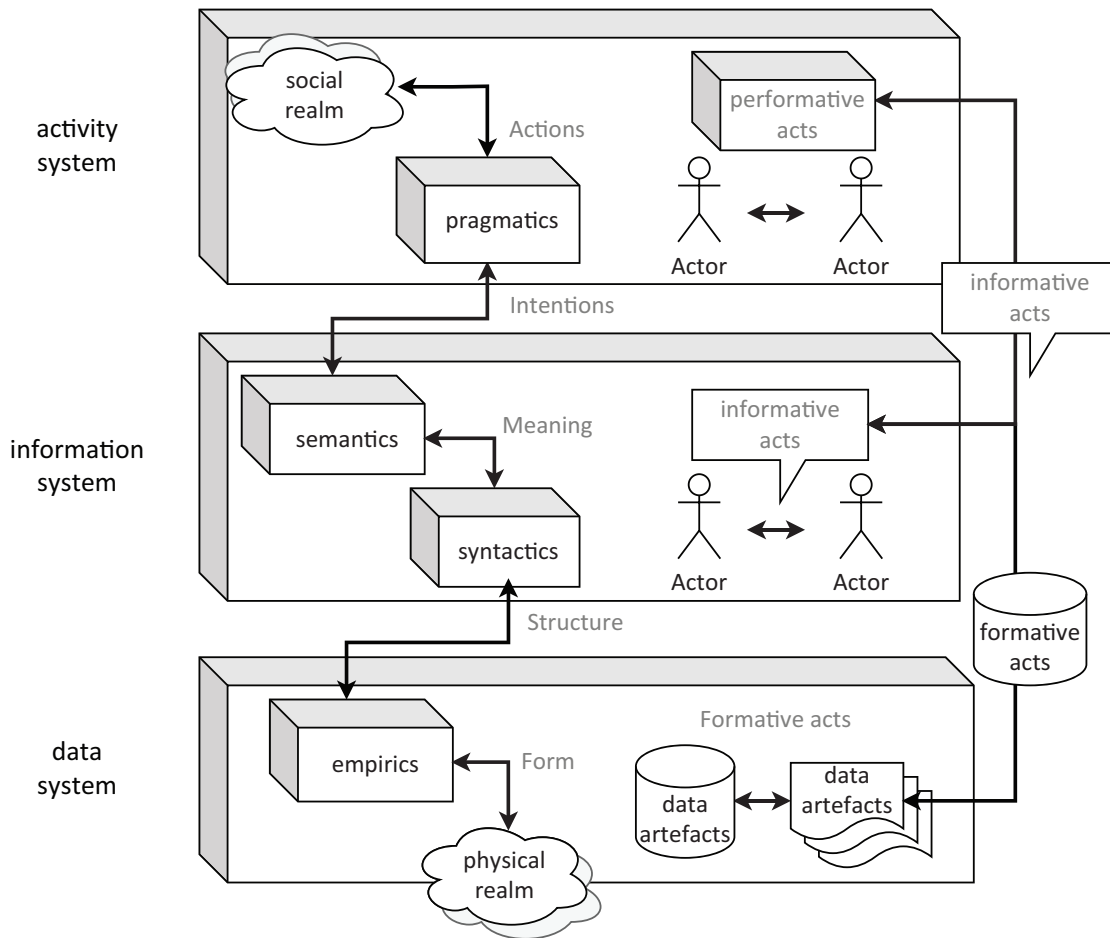
Figure 2. Conceptual framework for the enactment of significance through technology. Source: Adapted from Beynon-Davies (2010, p. 390).

As observed in other studies, citizen participation is seen as a performative activity where identity, motivation, and outcomes are contextual and evolve as they are enacted or "performed" (Turnhout et al., 2010).

6.2. The Seven Is of Smart Engagement

Through our integrative literature review, we can propose seven core characteristics as they relate to smart engagement. Rather than discrete, these characteristics are interdependent and multifaceted, also highlighting their phygital, socio-technical, context-dependent nature (Kitchin et al., 2019). We illustrate each of them with selective quotes from the reviewed national planning policy documents and add further discussion from the reviewed academic and industry literature.

6.2.1. Interoperability

"By focusing on the whole journey through planning, we will be able to develop the interoperability between systems to facilitate a truly digital planning system" (Scottish Government, 2020, p. 57). Interoperability is both technical and process-based as it leverages data

and software compatibility through shared standards and workflow integration (Kitchin et al., 2019). The unified approach proposed in the TPT for Scotland outlines one such comprehensive, "end-to-end" suite of digital planning applications, inspired by the ePlanning portal in Singapore. A fully mature data model would enable a unified platform for agile forms of planning that address local community needs proactively as they arise, also called "self-organisation'' (Levine et al., 2021). The challenges comprise organisational, individual, technocratic, and technological factors (Batty & Yang, 2022; Kitchin et al., 2019). Accordingly, the *Engaging for the Future* report by Commonplace (2021, p. 9) recommends the development of interoperability standards so that "local planning authorities can easily work together to ensure that engagement is not limited to their boundaries, when neighbourhoods and infrastructure cross boundaries." Interoperability requirements, therefore, underpin systemic integration.

6.2.2. Integration

"Develop flexibility—Make it easier for planning authorities to integrate new technology within a digital

ecosystem where apps and services can be adopted and reused as components of a flexible, cloud-based, modular platform" (Scottish Government, 2020, p. 19). Building on interoperability, the integration of data, information, and knowledge promises to overcome traditional siloes between intra-organisational departments, organisations, and professions, and between the wider public and planning actors (Batty & Yang, 2022; Kahila-Tani et al., 2019). Integration is also policy-related, as it pertains to sustainable placemaking. For example, the national planning policy for all three nations addresses integration in terms of planning outcomes and cross-policy synergies, including the integration of mixed-use neighbourhoods, transport and blue-green infrastructure, and integrated impact assessments for projects, plans, and policies. These hinge on the appropriate levels and types of data, information, and knowledge (including digital skills) for effective decision-making and collaborative ways of working (Batty & Yang, 2022; Wilson & Tewdwr-Jones, 2022).

Integration also presupposes that the input from smart citizen engagement will help shape the decisions that will in turn (re)shape places (Fung, 2015; Kahila-Tani et al., 2019). PlanTech can utilise data as "dialogue," an iterative, two-way journey featuring continuous data structuring and translation into social interaction and decisions, as mediated by information-rich digital ecosystems (Gil, 2020). Smart engagement technologies can foster dialogue and bridge citizen and professional knowledge about places in powerful ways, particularly if these transcend consensus-based approaches to participation that may be designed to sideline alternative development trajectories and discourses (cf. Akmentina, 2022; Rosol, 2015).

6.2.3. Intelligence

"We will take a radical, digital-first approach to modernise the planning process. This means moving from a process based on documents to a process driven by data" (Ministry of Housing, Communities & Local Government, 2020, p. 21). "Embed a data-driven policy approach where development of policies considers data needs and opportunities at the earliest point, supporting planning policy by continuous monitoring of impact and iterative improvement" (Scottish Government, 2020, p. 52). A smart digital planning system that facilitates "data-driven" or "evidence-based" decision making can be presumed to be "intelligent." Intelligence in planning is simultaneously locational and cross-sectoral to enable collaborative design, management, and effective community involvement for sustainable placemaking. This includes the ability to identify suitable sites for different types of development, quantify housing requirements, and monitor trends through urban analytics, which requires (geo)spatial, digital, and data literacy as well as domain expertise (Kitchin et al., 2019; Parker & Street, 2021; Roche, 2014). Also, interoperability and

integration both hinge on an extensive range of computerised codes and algorithms (i.e., artificial intelligence) for partial automation of planning rules or to extract and transpose meaning from citizen input (Hasanzadeh & Fagerholm, 2022; Kitchin et al., 2019). Ultimately, technology enhances human judgement and cannot replace it. Smart engagement requires a professional understanding that citizen input data is in fact living knowledge, which always risks being flattened to one of many data layers in a digital environment (Cardullo & Kitchin, 2019).

6.2.4. Inclusion

> Design is an inclusive process, which can raise public aspirations, reinforce civic pride and create a sense of place and help shape its future. For those proposing new development, early engagement can help to secure public acceptance of new development. (Welsh Government, 2021b, p. 24)

"Value and integrate non-digital interactions—Promote greater digital inclusion and recognise that digital should support professional judgements in planning" (Scottish Government, 2020, p. 19). Smart engagement should be inclusive and diverse by design (RTPI, 2020). Phygital approaches for participation build on the smart use of both digital and in-person participatory methods over the course of planning processes (Babelon, 2021). Accordingly, digital-first approaches to participatory planning cannot be "digital only," lest one should continue to exclude those who are least involved, and potentially most affected by, planning decisions (Commonplace, 2021; RTPI, 2020). Inclusive participation also hinges on the successful integration of citizen input in digital planning systems and evidence-based policy (Cardullo & Kitchin, 2019; Fung, 2015).

6.2.5. Intentionality

> Decisions on where growth will be focused, how places will function, how people will move across regions and wider environmental designations must be shaped by an understanding of cross-boundary issues. This will ensure…that regions do not unintentionally or unnecessarily compete for certain types of development. (Welsh Government, 2021a, p. 104)

Intentionality guides planning. The policy provides a vision augmented by mission statements, orientations, and guiding principles to facilitate opportunities for sustainable placemaking. Well-intentioned smart engagement also incorporates a politics and poetics of "care" and kindness towards end-users, as exemplified also in planners' desire to benefit communities as a popular motivation for joining the profession (Bicquelet-Lock & Taylor, 2020; Forester, 2020). Likewise, a digitally-enabled planning system requires an intentional design to guarantee both efficiency and democratic effectiveness (Batty &

Yang, 2022; Cardullo & Kitchin, 2019). Because decision-making in planning entails trade-offs between competing interests and land uses, intentionality also underpins evidence-based human judgements that transcend binary machinic insights (Kitchin et al., 2019).

6.2.6. Interface(s)

"The technology we implement for a future digital planning system needs to support, and interface with, a full range of capabilities. This integration will allow us to meet the ambitions for transformation and innovation that our strategy outlines" (Scottish Government, 2020, p. 77). "Throughout the planning system, opportunities are available for everyone to engage in local development planning and the development decisions which affect them. Such engagement, undertaken in line with statutory requirements, should be early, collaborative, meaningful and proportionate" (Scottish Government, 2021, p. 70). As related to inclusion, smart engagement through and beyond a digital planning system requires multiple interfaces, both digital and human. We contend that this is best delivered through plural, collaborative ecologies of information-rich environments, ranging from traditional engagement and consultation methods to ideation platforms and data portals that shed light on the opportunities and constraints that affect statutory planning and placemaking. Face-to-face interactions remain vital even as digital-first approaches are adopted and synergies can be achieved through iterative phygital engagement (Babelon, 2021; RTPI, 2020). Within the localism agenda across Britain, community-led planning in the form of local place plans (Wales and Scotland) and neighbourhood plans (England) enable citizens to enhance existing local development plans and strategies by addressing emerging community needs and aspirations, even if these may be under-resourced and non-representative of the communities they work for (Lynn & Wargent, 2017).

6.2.7. Invisibility

[Deliver a] joined up, holistic and providing an end-to-end service for customers: By this we mean the experience a customer receives when using the planning system is seamless and joined up, regardless of where the underpinning data, policy and systems are derived. (Scottish Government, 2020, p. 41)

System operations may become truly invisible to end-users when seamless and fully integrated. Framed positively, seamlessness can provide a positive user experience and optimise collaboration, community involvement, and workflow integration to improve decisions (Batty & Yang, 2022; Gil, 2020). Conversely, opaque data governance and a technocratic agenda for smart engagement and decision-making can support non-democratic uses of technology and collected data for surveillance

and undemocratic purposes (Cardullo & Kitchin, 2019). There are also latent risks of technological vendor lock-ins and lack of visibility about the complex webs of digital solutions providers (Devlin, 2020; Kitchin, 2014). Invisibility not also relates to active surveillance through tracking systems, but also to Foucauldian, panopticon-like modes of embedded rules, conducts of social interaction, and related aspects of distributed social control that operate through cultural norms and narratives. Such norms may include blind faith in the hope that digital-only approaches will foster more inclusive public consultations and lead to smarter, better and faster decisions across the whole planning system (cf. Kitchin et al., 2019; Rosol, 2015; Swyngedouw, 2005).

6.3. Three Pillars for Smart Engagement

To further support the development of the conceptual model for smart engagement, three interdependent "pillars" capturing high-level requirements for a smart, participatory digital planning system can be proposed. Below each pillar resides a selection of fundamental issues that smarter phygital engagement would need to address head-on to bridge the challenges discussed earlier in the article (see Figure 1).

6.3.1. Well-Informed, Literate Residents (Users)

Work with partners to enable digital participation and inclusion to ensure no one is left behind in a digitally transformed planning system and ensure that people have the skills, confidence and information literacy required to make the most of being online. (Scottish Government, 2020, p. 69)

Primarily, smart engagement needs well-informed users who are literate about the various aspects of digital planning: spatially, civically, digitally, and planning-wise, with awareness of the interrelated domains and technological systems, including basic associated skills, that together would improve users' capacity to engage effectively in a planning system undergoing continuous reform (Babelon, 2021; Commonplace, 2021; Healey, 2012; Hildreth, 2012; Kitchin et al., 2019; Roche, 2014). Such literacy is fundamental to deriving value from the digital and data infrastructures that underpin "smart" placemaking processes (cf. Hildreth, 2012; Kitchin et al., 2021; Roche, 2014). Biased forms of participation, non-participation, and lack of awareness among residents are common signs of misalignment between the alleged aims of an inclusive, planning system on the one hand, and the complex realities of digital and civic divides within communities (Commonplace, 2021; RTPI, 2020).

6.3.2. Well-Resourced Planners and Local Authorities

"We recognise that local planning departments need to have the right people with the right skills, as well as

the necessary resources, to implement these reforms successfully" (Ministry of Housing, Communities & Local Government, 2020, p. 70). Secondly, planners and local authorities need sufficient resources to engage and integrate citizen input in planning workflows and decisions, including staff hours, budgets, skills, and supporting organisational cultures (Babelon, 2021; Boland et al., 2022; Devlin, 2020; Kleinhans et al., 2021; Patterson-Waterston et al., 2020). The technocratic components of PlanTech promise to free up time for planners from automatable tasks to build trust with residents through various forms of engagement, and partake in creative planning activities.

6.3.3. Methods and Tools for Public Participation

Planning authorities, applicants, key agencies and communities have a responsibility to consult and engage others collaboratively, meaningfully and proportionately. Throughout the planning system, opportunities are available for everyone to engage in local development planning and the development decisions which affect them. (Scottish Government, 2021, p. 70)

Thirdly, plural, hybrid tools and interfaces can facilitate such well-informed and well-resourced interaction and collaboration between planning professionals and residents. Information, while commonly portrayed as the "low-hanging fruit" of public participation, is in fact a fundamental building block of all participatory activities that could characterise smart engagement (Babelon, 2021). Although the British policy remains unclear as to how digital-first approaches could be compensated with in-person methods, it encourages inclusion and collaboration, which presuppose a diverse range of methods and tools to proactively engage different communities. The benefit of deploying diverse engagement methods is to involve different people in ways that are unique to the methods used (Fung, 2015; Pocewicz et al., 2012).

7. Conclusions and Future Research Opportunities

This article has presented a preliminary research agenda and conception of smarter phygital engagement. In the face of a neoliberal, fragmented, and "cash-strapped" planning system where local planning authority planners struggle to implement decisions with a true presumption of sustainable development, as analysts and local authority planners have observed, digital solutions offer to provide a wide range of functionalities, but may not easily facilitate direct dialogue between residents and planners. The literature review highlights the heavy strain experienced by planning professionals and citizens, which reveals fundamental socio-technical cracks in the planning system. At the same time, the selection of reviewed policy documents indicates opportunities and a desire to optimise planning processes and improve the quality of planning outputs (i.e., new development) while

engaging more people in more diverse ways via digital public consultations. However, the study has shown that the emphasis given towards the adoption of digital solutions to support the planning system differs across the three British nations. Most notably, Welsh policy makes little reference to a need for such adoption, with the focus instead given towards the requirement to improve the digital infrastructure (broadband). In comparison, while not all of the reviewed policies for England and Scotland discuss digital planning, the PfF (England) and TPT (Scotland) are clear on the need to adopt digital technologies in planning to improve efficiencies, cut costs, and support civic engagement. However, as discussed in the literature, an over-focus on digital-first approaches can be concerning, promising to exclude engagement just as much as in-person methods. While the reviewed policies for all three nations address digital divides and exclusion by highlighting the need to improve digital skills, offering financial support for access to broadband and devices, and providing a sound digital infrastructure, little mention is made of the more complex, structural effects of marginalisation that prevent many people from engaging effectively online or at all, as discussed within the literature review. The policies also make no mention of the need for information-rich ecologies of participation that adopt both digital and physical ("phygital'') methods to guarantee high-quality citizen input and improve the capacity for residents to engage in public consultations. For effective participation to work, both problem-exploration and problem-solving are needed, which would facilitate a critical pragmatic approach in planning without constraining participants' views, understandings, and aspirations. Echoing recent approaches in retail, "omnichannel" approaches to public consultations can—provided the necessary budget, capacity, and willingness to engage and be engaged—help to bridge some of the gaps between the strain in continuous planning reform and the edge(s) of digital participation. To address this opportunity, a conceptual model for participatory phygital planning that adopts Beyon-Davies' unified conception of information, systems, and technology has been proposed. The conceptual model presented sets out seven Is (characteristics) of information-rich phygital ecologies and three interdependent "pillars" for a smart engagement, established as a result of the integrative study presented in this article. The conceptual model enables us to gaze both deeply and broadly into opportunities for current and future phygital approaches to smart engagement in planning. The approach will benefit practitioners, policy-makers, researchers, and activists who seek pragmatic ways of addressing the challenges that digital-first engagement poses for smarter decisions in planning. However, to test this understanding and further develop this preliminary research, it is suggested that longitudinal policy evaluation, industry insight, and empirical academic studies would shed light on whether and how phygital engagement could produce smarter planning practices and decisions.

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