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# How Do Researchers and Public Officials Co-Navigate e-Participation Implementation? An Action-Research Experience with South African Municipalities

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**Abstract:** How can local governments in the Global South effectively implement and sustain digital public participation initiatives, and what specific roles do public officials and knowledge intermediaries play in catalysing and supporting this digital transformation? In this paper, we respond to this query by examining our experiences as researchers in implementing an ongoing multi-year applied research project on e-participation and policy modelling in various South African municipalities. The project and the country's ongoing public participation initiatives align with government policy emphasising citizen-centric public service delivery through consultation, transparency, and accountability. We aim to highlight the practical aspects of introducing e-participation mechanisms in local governance structures with different human and material resource capacity levels, which is the case in Global South contexts. Our central question is as follows: How can public officials, working alongside researchers and knowledge intermediaries, navigate the sustainable adoption of e-participation through participatory design, system awareness, and bricolage? We explore this question from the perspective of researchers leading the implementation of a multi-year, participatory action-research project which aims to pilot e-participation in six municipalities across South Africa. In the paper, we analyse the interplay of various socio-technical factors influencing the early stages of implementation and use of e-participation tools in local government. Our findings highlight the importance of building socio-technical agency of front-line public participation officials, exploring malleable technologies that are flexible to adaptation, facilitating peer-learning amongst officials on what works in similar contexts, and having a system view within and across pilots.

**Keywords:** e-participation; bricolage; digital governance; participatory governance; participatory design; global south; South Africa

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## 1. Introduction

Adopting e-participation in local governance has emerged as a promising approach to enhance transparency, accountability, and citizen engagement in government decision-making processes. In South Africa, this digital transformation aligns with the Batho Pele ("People First") principles, which place citizens at the centre of public service delivery. These principles, emphasising consultation, transparency, and accountability, provide a crucial framework for building trust and fostering collaboration between municipalities and citizens in the digital age [1]. They are valuable normative instruments for implementing good governance in public service delivery. Alignment with the principles helps local

government fulfil its mandate of serving citizens while maintaining high governance standards. Digitally enabled approaches to governance are seen as critical for realising these objectives in the South African context but also in other parts of the continent where strides have been made towards making e-governance a reality [2].

For the purposes of this paper, we see e-government and e-participation as distinct but overlapping fields of practice and research, which work together in serving the higher level (and sometimes distinctive) objectives of e- or digital *governance*, a term which spans various decision-making processes and normative goals such as transparency and accountability. Drawing on contested literature [3,4], we refer to a narrower version of e-government that is primarily aimed at the internal use of technology by the government to improve efficiency and in providing digital government services to citizens, including the infrastructure for online payments, document submissions, and service tracking. While e-participation may depend on e-government systems, it is primarily concerned with using digital instruments to facilitate direct engagement between citizens and government entities on policy and service delivery decision-making and oversight. It is, therefore, closely associated with more networked forms of public interest decision-making and control of resource allocation, where the role of government is de-centred. From a South African perspective (and similarly for other regions), e-participation tends to exclude and complement or come into conflict with more representative forms of democratic decision-making and accountability mechanisms such as (e-)voting [5]. In municipalities, e-government and e-participation components are brought together by local governance actors, which set up the digital government systems to provide services, build e-participation platforms to engage the community, use the feedback and data gathered to enhance service delivery and make better decisions based on citizens' opinions.

Aspirations aside, African countries, including South Africa, have faced formidable challenges in designing and implementing e-governance programmes [6], and this paper seeks to contribute to a deeper understanding of how technology design and development practices may be adapted to navigate the complexities of Global South governance environments. Specifically, we examine the social and technical aspects of implementing digital tools and technologies for citizen engagement in South African municipal planning and policy formulation processes. We focus on insights gained from an ongoing multi-year participatory action-research project, which provides a unique lens to observe emerging social dynamics, technology choices, and institutional practices across partner municipalities and project stakeholders.

The cornerstone of our investigation is the role of public officials, whose agency and influence are critical in integrating e-participation platforms into local participatory systems, and us, the researchers, as knowledge intermediaries or bricoleurs and the interaction between these groups during a form of co-design process. We are particularly interested in how officials navigate civic engagement's complex, relational spaces [7] while overcoming internal organisational resistance and fostering cultural shifts towards more responsive and open governance [2]. Our methodological approach draws on insights from participatory governance, participatory design, and bricolage as socio-technical systems theory (STS) lenses. Our approach to the project is grounded in a comprehensive understanding of the South African context, which is characterised by endemic poverty and one of the highest inequality rates in the world, with a Gini coefficient of approximately 0.67 [3]; a distinctive governance environment involving a diversity of political influences, from traditional authorities to expert committees; and drawing on a range of existing technologies and practices, significant technological and social changes, and widely adopted research and design methodologies. We also consider nuanced yet potentially impactful shifts in applying these practices.

As a design approach, and a guide for the research and learning process, participatory design is especially relevant to local e-participation implementation in spanning both urban governance and information system development. In urban governance, participatory design involves integrating community input into decision-making processes [4]. Similarly, in computer science and information systems, PD is a collaborative approach that synthesises user expertise with the technical skills of system designers [5].

In local governance, participatory design manifests in processes like *participatory budgeting* (residents engage in budget discussions to ensure local priorities are reflected), *community-driven urban renewal* (citizens design and implement infrastructure projects such as public libraries and parks) and *co-design workshops and neighbourhood planning councils* (residents participate in land use and development decisions).

These practices emphasise collective learning and shared decision-making, ensuring that resident and user needs are effectively integrated into the design process and reflected in e-participation system development and, ultimately, service and infrastructure provision. Thus, from both urban and technological perspectives, participatory design contributes to a broader culture of participatory governance within local environments.

While recognising the contributions of participatory design, the nature of implementation and adoption is also acknowledged as being more chaotic and fraught with organisational and institutional challenges than often depicted, especially in developing countries [6,8].

One of the key observations of e-participation and e-government researchers over the past decade has been how users improvise with the designed systems or available resources to achieve their goals, usually in unexpected ways, often referred to as bricolage. These unexpected adaptations by users and user-driven innovations are particularly relevant to developing contexts where users often interact with tools developed in other parts of the world [9].

Another observation has been how different actors play specific roles (with associated motivations and values) in facilitating adaptation and adoption within a wider socio-technical network. In particular, there is a renewed interest in public officials' capabilities, practices, and values as champions of public sector reform [10]. For government officials, being able to navigate the messy, highly relational spaces of civic engagement [7] depends on how well they can overcome internal organisational resistance and encourage broader cultural shifts towards more responsive and open ways of working [2]. At the same time, the nature of modern public manager work has been influenced by trends in the digital and innovation fields, including a stronger emphasis on flexibility and openness [11], but also more explicit attention to the empowerment and agency of 'reformists' which seek to facilitate a more responsive approach to citizen interaction. A crucial part of such an agency is that public officials demand a more active role in designing e-participation systems, including supporting co-design with citizens. Also critical is public officials' awareness of how a design process takes place within a complex socio-technical system, possible approaches for integrating and reconciling diverse interests [12], and fostering innovation and leveraging existing social relationships and material artefacts to solve problems [13].

These STS lenses have the potential to offer a more nuanced view of the way in which social aspects (citizen needs, municipal officials, political and social interactions) interface with technical aspects (technology and organisational processes) to foster innovation. For South Africa, these insights offer great potential for understanding how e-participation projects can be implemented sustainably. Ultimately, the impact of technology will depend on how it is designed and who is involved, and from participatory governance and design perspectives, prioritising the traditionally marginalised communities and individuals who have not been able to contribute to local policy and planning and e-participation technology

implementation processes. But, for local governments to take the lead in participatory methods, we need a deeper understanding of how public officials can enrol both internal and external institutional support and manage competing political pressures towards inclusive implementation approaches [14]. This includes understanding how they enrol or relate to us, as external researchers, and how we can enable the reforms and actions taken towards these goals.

By examining these elements, we seek to understand how researchers can effectively collaborate with public officials to advance e-participation initiatives in South African municipalities. Our central question is as follows: *How can public officials, working alongside researchers, navigate the sustainable adoption of e-participation through participatory design, system awareness, and bricolage approaches?*

We explore this question from the perspective of researchers implementing a multi-year project: e-Participation and Policy Modelling Platform for South Africa (ePPMOSA). The project is an initiative of the South African Department of Science, Technology and Innovation (DSTI), with funding from the European Union (EU) and National Treasury. It aims to pilot e-participation in seven South African municipalities between 2022 and 2025.

This study contributes to the growing body of knowledge on e-participation and digital governance, offering practical insights for municipalities seeking to enhance digital citizen engagement in Global South contexts. By focusing on the interplay between public officials, technology, and institutional practices, we aim to shed light on effective strategies for implementing and sustaining e-participation initiatives. By reflecting on our own experiences as researchers on the ePPMOSA project and our observations of public officials driving participatory governance in local government, we explore how digital technology adoption is shaped by a range of co-design and bricoleur practices in support of broader organisational and social change.

Three key concepts frame our research:

1. Participatory governance and design as they relate to both outcome and approach in urban governance and technology development, incorporating user needs into decision-making and service provision whilst recognising the systemic influences and impact of these initiatives.
2. Users' adaptation and improvisation of e-participation tools are particularly relevant in developing contexts where tools may originate from different parts of the world [15,16].
3. The evolving role of public officials as champions of public sector reform, with a renewed focus on their capabilities, practices, and values in facilitating responsive governance and institutionalisation of e-participation [10].

Whilst certain findings reflect similar experiences observed by researchers over the past two decades and in other regions, there are processes particular to the ePPMOSA project identified in the results which seem to offer new opportunities for learning beyond this paper. One of these is the positioning of this project within a wider transformative or mission-oriented innovation interest that potentially offers new mechanisms for protecting and scaling the pilot initiatives within an explicitly defined process of system transformation. Another is the rapid, user-driven assembly of technology capabilities based on expanded access to (relatively) low-cost cloud services, and the implications for technology governance and integration going forward (as well as related policy implications such as data localisation and privacy management).

The rest of our argument is structured as follows: In the literature review, we consider previous research and theoretical frames that we view as relevant to exploring these issues. In the Methods Section, we detail our participatory action-research approach, describing the project framework, data collection techniques, and analytical methods employed.

The Results Section presents our key findings, focusing on the roles of public officials and knowledge intermediaries, the effectiveness of participatory design and bricolage approaches, and the factors influencing sustainable e-participation adoption in South African municipalities. In the Discussion, we interpret these findings in the context of existing literature on e-participation and public sector innovation, highlighting the implications for practice and policy. We conclude by summarising the main contributions of our study, acknowledging limitations, and suggesting directions for future research in e-participation within Global South contexts.

## 2. Key Concepts for e-Participation Design, Implementation and Institutionalisation

Growing evidence points to the rapid expansion of e-participation as a tool for engagement and strengthened collaboration between governments and citizens worldwide [7]. The objective of e-participation is to improve access to information and public services as well as to promote participation in policy-making, both for the empowerment of individual citizens and the benefit of society as a whole. Local governance refers to processes and structures used to organise and execute collective action at a local level [17]. In other words, it refers to managing and making decisions for a specific area, such as a city, town, or district. The process involves various stakeholders, including local government officials, legislative bodies, community leaders, residents and organisations such as neighbourhood associations. In South Africa, the structure and responsibilities of local government related to planning, budgeting, and policy-making, and the associated community participation mandate, are included in chapter seven (Sections 151–164) of the country's Constitution and reflected in various supporting legislation and jurisprudence. In this context, electronic, digital or e-participation refers to using digital tools to allow citizens to participate in local decision-making and governance processes, a key tenet of participatory governance, and captured in certain parts of the above legislation along with various digital policies and laws which enable e-participation adoption [8].

As introduced in the definition discussion above, and for many advocates of this work, e-participation can refer to public involvement in a broad 'spectrum' of democratic and political processes but also to the more mundane digital submission of forms and applications for municipal services (but also co-design of services) [3,4,9]. Nonetheless, for this paper, our primary focus is on e-participation as the digital services provided by governments and devices being used by citizens to understand and influence planning, budgeting, and policy formulation, with associated oversight on implementation. This enables the voices of communities to be heard, and for them to have input in governance processes.

To help government actors realise these objectives, various stakeholders and researchers have sought to develop guidance and benchmarks which outline key actions, factors and outcomes influencing the practice and sustainability of e-participation. The United Nations (UN) has been a key influence on e-governance and e-participation practice, mainly through the regular E-Government Survey [7] but also through a tool, the Measurement and Evaluation Tool for Citizen Engagement and e-Participation (METEP), which is used to measure the enabling legal and organisational environment as well as outcomes of citizen engagement at the local government level. The tool has been widely adopted as a litmus test for e-participation by local governments worldwide [18,19].

Such studies and tools point to key factors that need to be addressed when looking to implement e-participation in a sustainable way as well as macro-level conditions affecting adoption across countries. There are also many researcher-developed frameworks, based on observations of project implementations, which have helped to guide the design (e.g., [10]) and evaluation (e.g., [11]) of e-participation initiatives.

Recent systematic reviews have pointed to a more nuanced set of factors that affect the 'diffusion' of e-participation in public administrations and the extent to which they are sustainable in generating public value [12,13]. This includes, amongst others, the availability of specific technical skills in organisations and associated learning strategies, as well as the influence of organisational culture and related themes like a willingness to let citizens influence decision-making. However, there are gaps in the research around certain topics, especially with respect to the institutionalisation of e-participation initiatives within organisational environments (as a third stage after adoption and implementation), and the individual motivations and strategies of public officials (and other actors) in shaping implementation and institutionalisation.

From a researcher–practitioner perspective, these have been important considerations for our work on the ePPMOSA project, and have shaped the way in which the project design has been adapted and is being implemented, as described in the Results Section. We have also benefitted from certain socio-technical lenses that have shaped who we seek to work within the local government organisation, and how this interaction takes place.

In the following sub-sections, we outline key concepts that have been relevant in framing this process and which can be used for reflecting on activities and outcomes. First, we consider what participatory governance means as a goal for e-participation but also as a design or implementation approach. Second, we consider the role of public officials in this approach. And finally, we examine what participatory governance means in a South African context.

### 2.1. Participatory Governance and Design

The first concepts we address are participatory governance and participatory design. Whilst distinct terms, together, they speak to the role of citizens in public administration and policy-making not just as passive recipients, but as active contributors to the decision-making process. As noted in the Introduction, by spanning both information systems and urban governance fields, this applies to both what (e-)participation seeks to achieve and the way in which (e-)participation projects are developed and operated.

In their paper, *Participatory Governance in Smart Cities*, Shadowne, Lodato, and Loi [7] define participatory governance as a multifaceted approach emphasising citizens' active involvement in policy-making and programme development. For them, PG extends beyond simple consultation as it aims to engage citizens directly in creating and implementing policies and public initiatives [20]. Four aspects highlighted by Shadowne et al. [7] are particularly relevant to our analysis: (i) participatory governance is dynamic by nature and invites citizens' direct involvement in shaping public policy, rather than limiting inputs to consultations; (ii) it is complex and messy as the process entails diverse forms of participation and includes different interests and goals; (iii) PG is context-dependent, requiring adaptation to specific issues, which are often contested or undefined; and (iv) it provides a space for social learning as stakeholders engage in defining and understanding the problems they aim to address.

Authors such as Arnstein [21], Collins and Ison [22], Tritter and McCallum [23], and Bernades et al. [24] have considered the nature of participation and its relationship to public sector governance with observations that continue to be relevant to the use of digital channels in facilitating communication between citizens and the state. Arnstein's "ladder" of participation is a widely referenced model where citizen participation is synonymous with "citizen power" categorised according to levels of citizen involvement. However, as Tritter and McCallum [25] note, Arnstein's hierarchical framework equates participation with power, overlooking critical aspects of how policy is implemented and executed over time. For them, the complexities and long timelines involved in governance processes need to be

better acknowledged through a "mosaic" approach to participation. In this collaborative model, stakeholders, including experts, officials, and citizens are seen as "co-producers" and co-participants. Going further, Collins and Ison [22] highlight the significance of social learning in participation, as knowledge and understanding are constructed through participation itself and issues and policy direction are negotiated.

For these authors, while participatory governance is a dynamic process that aims to be inclusive and adaptive, its implementation, including the role played by digital tools, is often hindered by entrenched power dynamics and structural limitations. Indeed, as Bernades et al. note [24] (p. 453), "administrations tend to reproduce in their government portals the same pre-existing governance structure, making decisions in a vertical way (top-down), with reduced transparency and openness to popular participation". Overall, the ability to participate, either digitally or through traditional channels, does not always equate to the ability to impact. So, we need to consider how participatory systems (and digital tools) are actually designed and implemented, what outcomes they lead to, and how both of these relate to institutional dynamics.

One way of examining this in more detail is to look at participatory governance from the perspective of responsiveness, but in a broader sense than simply government responding to citizens as clients or customers [14]. In their study of participatory governance in a South African municipality, Vivier and Sanchez Betancourt [26] reflect on the importance of bureaucratic responsiveness. Using a systems lens to explore the interactions between local officials' agency and the integration of diverse forms of knowledge, they discuss how participation practices, structures, and platforms influence one another, identifying two key elements of responsive municipal governance: the agency of local officials and organisational support and coordination. Therefore, systemic factors, including normative and institutional elements, shape municipalities' ability to implement participatory governance. As they note, "officials stand at the frontline of policy implementation and are expected to give flesh to the ideals of participatory governance". Their study suggests three key aspects that influence responsiveness: personalisation, co-creation, and institutional coordination.

The *personalisation of responsiveness* refers to how engagement often depends on the discretion and initiative of individual officials; without sufficient organisational support, particularly in terms of learning and coordination, effectiveness is compromised. The *co-creation of responsiveness* highlights the critical importance of knowledge-sharing and collective learning in local governance. Lastly, the *institutionalisation of responsiveness* underscores the need to improve internal coordination by aligning goals and responsibilities across participatory processes and platforms.

Here, we start to see some of the more specific aspects of what scholars have called for in seeking to understand the mechanisms underlying the adoption, sustainability, and public value of e-participation [12,13]. A strong underlying expectation is that participatory governance and design researchers or officials consider the systemic nature of the implementation process and impacts, whether that is more informal and relational or more formal and organisational. As a recent example relevant to this point, the work by De la Rosa, Ruecker, and Giraldo Nohora [27] focuses on the relationship between design, complex social systems, and policy-making. Their research explores how design can enhance democratic participation, particularly by creating spaces where marginalised voices can emerge and alternative solutions are considered. Reminding us that complex social systems cannot be redefined or transformed without the input of those affected, the authors highlight the risk of popular 'user'-centric design tools being used to maintain the status quo, preserving power imbalances and societal inequalities. As they suggest, participatory design and systemic mapping hold part of the answer to deal with this. They argue that the power of design lies in its ability to create actionable plans for change. Within this context,

systemic mapping and prototyping are seen as essential for facilitating engagement that is more inclusive and aware of the need or potential for wider change, similar to ideas contained in the transformative and mission-oriented innovation literature [28,29]. While systemic maps serve as platforms for deliberation, incorporating diverse visions of the future, "intentionally displaced" prototypes serve as conversational objects that stimulate open dialogue about alternative futures whilst making potential outcomes tangible. This approach differs from traditional design projects, which often focus solely on finding solutions to individual user needs or predefined problems and could facilitate discussion on the broader goals and, very importantly, on values.

### 2.2. Public Officials in Participatory Governance and Design

The previous section pointed to what has become a much wider renewal of interest in the capabilities, practices, and values of public officials as champions of public sector reform, whether through participatory governance or the use of digital tools. For civil servants, being able to navigate the messy, highly relational spaces of civic engagement outlined by Shadowne et al. [7] depends on how well they can overcome internal organisational resistance and encourage broader cultural shifts towards more responsive and open ways of working. Joshi and McCluskey highlight the following [30] (p. 8):

> *"ICT-enabled citizen voice leads to government responsiveness only when public officials already care to respond. When citizens email and send text messages directly to reformists, public officials can use them as real-time alerts and supporting evidence to persuade colleagues to respond. In addition, many [public official] reformists are not only alert to recognising problems faced by communities, but also to raising them proactively in organisational discussions, particularly when citizens are afraid of reprisals for demanding accountability".*

The nature of modern public manager work has been influenced by trends in the digital and innovation fields, including a stronger emphasis on flexibility and openness [31], but also more explicit attention to the empowerment and agency of 'reformists' which seek to facilitate a more responsive approach to citizen interaction. A key part of such agency is public officials demanding a more active role in the design of e-participation systems, which potentially includes their own support for co-design of tools and processes with citizens. In the case of front-line public officials (and affected citizens if involved in the co-creation process), such design practices allow them to regain some control over democratic functioning and policy-making processes which has increasingly been shifted to 'system-level' bureaucrats in the form of consultants and technology developers [25].

There is another perspective on technology design and use noted earlier, which can aid our understanding of public official agency: an extensive body of research explores how civil servants improvise processes in ad hoc and unintended ways by seeking pragmatic responses to what is possible and achievable in a practice referred to as *bricolage* [32]. Given the prevalence of digital services and tools, improvisation increasingly involves the adaptation of available information technologies. This means that public official 'users' may find and adopt technologies independently of internal IT specialists or external providers and use their social networks to learn and promote implementation amongst other officials (in a similar way to what we had seen amongst citizens in earlier e-participation research [33,34]). They may also then test tools with citizens or residents in real-life situations to receive feedback and adjust their approach. This contrasts with the more traditional technology (co-)design approaches, where the participation of public officials (and citizens and residents) still tends to be limited to making input on features during a controlled build and evaluation process run by IT specialists [35].

In a different setting, Mannara and Panni [36] illustrate how complex governance systems, in the form of a municipality, engage in bricolage to navigate resource constraints. They specifically look at land formalisation in Dar es Salaam, Tanzania, to demonstrate how municipal authorities and community leaders adapt formal legal frameworks with informal practices to make property rights workable for local needs. For our purposes, it illustrates how an intermediary, a community leader, and in our case, the research team, can adapt the existing framework alongside public officials to meet the community's needs.

Recent work on bricolage in the public sector can offer deeper insights into possible practices that are being employed to effect change. Blijleven et al. [33] identify six mechanisms that officials use to align stakeholders around a reform agenda including understanding the situation, building rapport and trust, developing shared resolutions, aligning inside and outside, and supporting practically. Closely allied are mechanisms of collective learning amongst civil servants that lead to the adoption of new practices [37], which also reflects the social network bricolage supporting technology use amongst citizens noted by Ochara and Mawela [9]. Other research on bricolage has highlighted the different forms it may take, whether individual or collective; the nature of analysis being at micro, meso or macro levels [38]; and that it is distinct from co-design and similar practices [39] (p. 45).

The above literature points to insights developed in the wider design and STS research [40] fields on how local agency and experimentation by public officials can lead to system change

### *2.3. Digitalisation and Participatory Governance in a Developing Country Context*

In South Africa, efforts to embrace digitalisation in governance processes have been ongoing, with various new initiatives seeking to foster citizen engagement, transparency, and more efficient public service delivery. However, there are numerous challenges, including digital divides, infrastructure deficits, and persistent inequality, which have hindered the full realisation of participatory governance through digital means [41]. In the context of governance and digitalisation, in developing countries, where traditional governance structures are often slow, inefficient, or inaccessible, digital platforms offer a way to overcome barriers to participation [42]. Digitalisation has become a crucial component of governance reforms worldwide, with significant potential to enhance citizen participation and improve service delivery, particularly in developing countries [43].

Bawack et al. [44] use the National Social Insurance Fund (NSIF) example in Cameroon to illustrate how e-participation initiatives, powered by web tools and social media, facilitate more transparent, accountable, and citizen-engaging governance. This aligns well with digitalisation's crucial role in governance reforms worldwide, especially in contexts with limited traditional engagement mechanisms [16]. Previous studies on digitalisation and participatory governance in developing countries highlight both successes and challenges. E-governance initiatives in countries like India, Kenya and Brazil have shown the potential of technology impact on public service delivery, with digital platforms allowing citizens to interact with government services directly [45,46]. The use of technology in participatory governance often takes the form of online platforms for civic engagement, mobile apps for service monitoring, and data-driven decision-making. However, scholars have also pointed to challenges related to implementation and inclusion [47,48]. The same applies to South Africa's digital governance efforts, which face significant challenges, including a persistent digital divide, with rural and low-income communities often excluded from digital governance platforms due to a lack of internet access and digital literacy [49]. While urban areas have benefited from digital governance initiatives, the lack of comprehensive infrastructure in rural areas limits the potential for widespread citizen engagement.

The design processes and organisational arrangements supporting the adoption of emerging digital technologies in these contexts emerge from existing histories of information technology implementation as well as peer-learning and international influence. One example of this influence and associated practices which has been internalised by a relatively large number of African national and subnational governments is the Open Government Partnership (OGP). The OGP is a collaborative framework that promotes multi-stakeholder engagement and transparency, and which has placed a strong emphasis on the role of digital tools as enablers of open governance activities. The practices and tools provide a way for government officials, researchers, and civil society to address issues of public accountability collectively. Through OGP forums, stakeholders work together on policies and initiatives to increase public access to information, advance anti-corruption measures, and improve service delivery transparency [49,50].

Kenya and Ghana have implemented OGP initiatives, providing valuable case studies for the potential of alternative approaches to (e-)participation in Africa. In Kenya, platforms have been established for citizens to monitor public services, reinforcing the importance of accountability and empowering citizens to actively engage with government processes. For example, Elgeyo Marakwet County has participated in Kenya's subnational OGP initiative, focusing on budget transparency and anti-corruption. This echoes the Makueni County OGP Initiative, which promotes citizen participation through monitoring platforms for local governance [51]. Another example is the Sekondi-Takoradi Metropolitan Assembly (STMA) in Ghana, which has used OGP forums to enhance public safety and improve sanitation services through community involvement.

For South Africa, the goals of these efforts reflect the Constitutional expectations, legislative requirements, and Batho Pele values of consultation, transparency, and civic involvement [52]. Whilst the Batho Pele principles and OGP are similar in prioritising the transparency of government operations and decision-making to the public, in OGP, there is an emphasis on the proactive sharing of governmental data and information, which points to a shift in how responsiveness or engagement may take place. At the same time, OGP offers the technical instruments to actualise the Batho Pele principles, which provide programmatic directives for service delivery within an open government framework.

Perhaps more significant in OGP, and noted in the examples from other countries above, is the emphasis not just on openness as an outcome but on having a multi-stakeholder approach to defining and implementing open governance initiatives. This underscores the discussion in previous sections which note that participatory governance and design are central to how e-participation projects should be implemented. Also significant is the emphasis on peer-learning across the global OGP community with potential benefits for implementation but also challenges in how the partnership is perceived by local political actors and the contextualisation of what is seen as a more "Western"-led initiative.

## 3. Methodology

### *3.1. A Socio-Technical Systems and Participatory Action-Research Frame*

Frameworks for studying e-participation are often discipline-dependent. For example, political science leans towards frameworks such as public sphere theory that focuses on e-participation as an extension of the public sphere, or democratic theory focuses more on participation. Information systems disciplines lean towards frameworks such as the technology adoption models such as Diffusion of Innovation Theory and Unified Theory of Acceptance and Use of Technology (UTAUT). In this paper, as outlined in previous sections, we draw on a range of STS lenses to better understand the interconnectedness of socio-political factors and technology design practices. For example, we have noted how the concept of bricolage, the process of creating something from existing resources,

offers a powerful lens for (a potentially integrated) understanding of institutional, governance, and digital change. The theory shows how public officials and researchers can co-adapt/co-develop existing digital resources to find new ways to foster digital resources and civic engagement. We can therefore use bricolage to observe how municipal officials at project sites creatively combine socio-technical resources to design and implement e-participation projects. It can also help us explore how public officials and researchers navigate resource constraints, social elements, and technological complexities to create effective and sustainable e-participation solutions.

Whilst the previous sections have discussed bricolage as one of the guiding concepts that the ePPMOSA project team draws on to help us interrogate (and shape) what is happening with our municipality partners, along with ideas around participatory governance and design, as researchers, we see this initiative falling under a broader domain of participatory action research (PAR). PAR is a methodology which emphasises collaboration by bringing diverse stakeholders to engage in the research process to identify problems, develop solutions, have a say in implementation, and gather learnings. It acknowledges and deals with power asymmetries between researchers and other actors, and is therefore relevant to the principles of participatory governance and design. PAR provides a practical framework for engaging diverse stakeholders in a research-oriented project, offering a cyclical process (planning, acting, observing, and reflecting) that can significantly support the outcomes envisaged from local e-governance initiatives (see Reason and Bradbury 2008 [14]). It is particularly valuable for addressing power imbalances through tools such as participatory workshops, focus groups, and community meetings that bring together researchers and other project stakeholders—including government officials, residents and civil society organisations—to co-create solutions to specific challenges and reflect outcomes. Various researchers highlight the value of this approach in community-oriented engagements (see Gaventa 2006 [53]; Cornwall, 2008 [54]) and in many cases, these connect with government processes and dovetail with participatory governance actions and outcomes. One example is participatory budgeting, where citizens use PAR to identify community priorities, allocate resources, and assess the impact of decisions (see Wampler, 2012 [55]). In an example of researchers working with a South African municipality mentioned earlier, the project seemingly resulted in improved adoption of what the researchers were seeking to enable, and led to enhanced communication between citizens and local authorities, nurtured trust, and improved community engagement efforts around service delivery. While PAR methods vary, conscientisation and acknowledging power dynamics are at the core of the approach and its potential impact [56]. Nonetheless, as researchers in other settings have noted, the implementation of PAR approaches can sometimes be co-opted by stakeholders, reinforcing existing power differences and inequalities rather than challenging them [57,58], highlighting the need to look at contextual nuances carefully.

Aside from these benefits, PAR also provides insights into how, as researchers, data are collected and interpreted, primarily as part of the later parts of the action-research cycle. More specifically, as part of the wider spectrum of action-research methods, and anchored in the interpretative and qualitative tradition, PAR "embraces a dialectic of shifting understandings" [15]. This means that researchers' interpretation of what is happening is inherently contingent and evolving, potentially towards some "fusion of horizons" between researcher and subject perspectives [16]. For this paper, we have focused on our own (as researchers on the ePPMOSA project team) understanding of the activities and processes involved in the design and initial stages of implementation of the ePPMOSA project as a whole as well as the individual e-participation pilot projects. This has been performed through the process of writing up what we as co-authors have seen and viewed

as significant and the changes we have observed over time. Another part of the project seeks to capture the views of local officials and community members as we progress with pilots.

### 3.2. ePPMOSA Project and Municipality Pilot Frame

As part of this reflective process, it is necessary to provide some contextual background to how the initial project design was adjusted and translated into on-the-ground implementation actions. This is critical for framing the way in which the researchers experienced changes in the design of pilots, relationships with officials, and the results presented later in the paper.

The DSI Science, Technology and Innovation White Paper (2019) and Decadal Plan (2021–2031) envision digital technology as a catalyst for innovative governance models. In this context, the ePPMOSA e-participation and policy modelling project was conceived and designed to enhance transparency, integrity, accountability, and stakeholder participation to support better local participatory governance [59].

The project's primary objective was originally defined as the "development, testing and piloting of an e-participation and public policy modelling platform for local government to enable open collaboration in modelling public policies" [59] (p. 2). Several activities and sub-objectives were assigned to 'work packages' to realise this objective, most of which are implemented with municipality pilot partners. The main activities included the following:

- "Identifying and analysing existing international case studies and similar flagship projects around the world.
- Conducting literature studies on a number of well-known books, scientific journals and publications on the topic of e-participation and policy modelling.
- Researching and analysing existing local government and country-specific e-participation niches, and producing a report on their application and capability.
- Identifying international lighthouse projects in the EU Framework programme that could serve as a lighthouse project and conclude a collaboration agreement.
- Selecting appropriate public participation structures for piloting.
- Conceptualising an e-participation and policy modelling platform, analysing user requirements, developing specifications, and designing and developing the platform.
- Establish an e-participation community of practice under the relevant national forum for e-participation and policy modelling and undertaking scientific exchange and study visits.
- Piloting the e-participation platform in the municipal environment, making conference presentations, publishing scientific papers, and participating in policy dialogues." [59] (p. 2)

Municipalities were invited to apply to join the project and were accepted based on an evaluation performed by the DSI. Seven municipalities were included in the project as pilot partners (*See* Table 1). Four of those are 'metro' municipalities, which are primarily urban with large populations, and three are smaller municipalities in more rural areas. Whilst there is substantial variation and lower-level detail depending on the context and type of project, the key project actors in municipalities were invited to collaborate on certain high-level actions in implementing the pilots through nine potential workstreams, as listed in the table below. In line with this paper's focus on researcher interaction with public officials, the table outlines the responsibilities of the ePPMOSA project team (researchers) and municipalities, noting briefly the interface with the community or public actors as potential co-designers.

**Table 1.** Municipality and researcher responsibilities for pilot implementation, according to workstreams.

| Workstream | Municipality Responsibilities | ePPMOSA Project Team Responsibilities |
| --- | --- | --- |
| **Pilot project governance—setup** | Establishing governance structures to coordinate project implementation, working with the implementing entities. | Establishing governance structures to coordinate project implementation, working with the municipality. |
| **Pilot project governance—implementation, evaluation and transition** | Coordinating implementation, evaluation and transition of pilot projects, working with community intermediary(ies) and implementing entities.<br>Managing and operating the technology platforms once the pilot project is running, provided these are compatible with the municipalities' technology platforms. | Coordinating implementation, evaluation and transition of pilot projects, working with the municipality and community intermediary(ies).<br>Support the management and operation of the technology platforms once the pilot project is running. |
| **Mapping of policy and participation objectives, processes and stakeholders** | Providing information on or access to relevant people such that objectives and processes can be mapped.<br>Obtaining approval for processes from executives, committees or council. | Facilitating the mapping of participation objectives, processes and stakeholders and the approval of processes by providing relevant input to documentation and meetings. |
| **Technology evaluation, contracting, customisation, deployment and operation** | Providing relevant infrastructure to ensure platform technologies can be deployed and operated (such as on-site or cloud servers), and that end users can access the technologies (such as in offices, or via libraries or WiFi hotspots).<br>Managing the day-to-day operation, use and management of the technology once it has been deployed. | Facilitating the identification and selection of core e-participation and policy modelling technologies.<br>Contracting and payment of technology providers, providing implementation oversight, technical support, and designing a post-pilot transition approach with the municipality. |
| **(Meta)data definition, digitisation and governance** | Providing information on or access to relevant (meta)data sources to enable identification and definition. | Facilitating the identification, digitisation and definition of (meta)data relevant to the implementation of technology platforms and associated processes. |
| **Municipal official capacity building** | Identification and involvement of key officials to make input on requirements and participate in training to operate, use and manage the technology. | Facilitating input by municipal officials and providing training on the operation of the technology, use and management of the technology. |
| **Resident/community involvement** | Identification and communication with local intermediaries and the public on project objectives. | Supporting municipalities with public involvement including identifying stakeholders and exploring approaches to co-design. |
| **Community of practice (CoP)** | Contribute to a CoP peer-learning by sharing on pilot project experiences and other topics. | Facilitate the CoP. |

Through initial engagements, researchers recognised that municipalities engage residents in planning and policy activities through various existing in-person and digital or e-participation channels, such as their websites and social media. In most cases, then, a first phase or 'initial' piloting was designed and implemented to explore the use of existing or available technologies as a precursor to more advanced technology adoption. This included one or more interventions discussed below. What is important to note is that how the language and nature of activities around the project have evolved with respect to the original definition above, with a stronger emphasis on co-developing plans, reflection, and iterative technology development and learning.

- *Technology demonstration and minimum viable product (MVP) development:* At various stages of interaction, the project team sought to introduce and demonstrate different technologies that cover various potential capabilities and outcomes, from information sharing to deliberative interactions. In one case, this went as far as partnering on a hackathon with teams of young developers to build MVP examples of what future e-participation platforms could look like.
- *Civic tech education:* Where existing digital channels were under-utilised, the team would explore equipping residents and strengthening the engagement experience through in-person and virtual civic 'tech' education workshops to train and expose selected community members to the digital platforms and how these interface with local governance processes.
- *Information accessibility:* During the initial stages of the process, it became clear that much of the municipality information is in large documents, which makes it difficult for residents to find relevant content. This led to a strong emphasis on developing more targeted, interactive, and simple approaches for presenting local planning information. The project team therefore explored methods for extracting information from budget and planning documents, utilising both manual and automated techniques, developing alternative ways to present data and processes similar to the data infographics used in prior workshops, and investigating strategies for enhancing messaging about participation opportunities, including using translation.
- *Interaction features:* When engaging with information or contributing online, there are certain technology features that seem to be critical. This includes residents being able to easily find or filter relevant content using tools like interactive maps, charts, images, or natural language queries. They should be able to submit opinions or comments more interactively, such as by annotating images or maps, submitting audio clips, or engaging in natural language interactions (including in their local languages). Finally, digital tools must be accessible on mobile devices and low-data connections—including leveraging available channels like WhatsApp—to ensure all residents can participate. Zero-rating or reverse billing of data costs to access information or contribute inputs was also noted as critical.
- *Local e-participation promoters:* The above actions were limited to a relatively small group of participants within selected community pilot sites, and so the aim was for these participants to become enablers of wider technology use informing and training other members of their community. Municipalities may look to run platform awareness and registration drives in partnership with ward committee members or community-based organisations.
- *Evaluation sessions:* Where civic tech education workshops involved community members, an effort was made to hold post-event reflection or evaluation sessions to gauge the community's understanding and ease of use of existing digital platforms, and to discuss the way forward.
- *Co-developed pilot roadmap:* Whilst these initiatives continue, the municipalities have expressed interest in exploring additional ways of using digital technologies to reach and engage more meaningfully with a larger number of residents on planning, policy and innovation questions. This is leading to the design of a second phase of pilot planning that may involve more complex technologies and modified methods, and the co-development of a roadmap that seeks to connect (backwards and forwards) and plan actions.

- *Peer-learning exchanges:* Three in-person group workshops have been held in which participating municipalities, and municipalities from outside the project as well as external stakeholders, were able to share and discuss the use of technology to support public participation. In addition, ad hoc bilateral discussions have been facilitated by the researchers at the request of municipalities. This has been expanded significantly from the original plan for one group workshop.

## 4. Results

Although still in its initial stages, the project's implementation reveals a complex interplay of interactions and practices driven by four primary dynamics. These dynamics highlight the challenges and opportunities in implementing e-participation initiatives in South African municipalities and the relationship between researchers and public officials in seeking to design and implement pilot projects.

### *4.1. Front-Line Innovation to Meet Immediate Needs*

The initial approach to implementation envisioned developing a national technology platform for multiple municipalities. However, early engagements revealed that each municipality's needs and relationship-building processes would differ significantly due to varying municipality types and fluid political environments.

Municipalities had significant concerns about implementing externally developed technology platforms, citing limited in-house skills and high costs of advanced solutions [4,5]. This led to reorientating the project towards supporting a more diverse mix of municipality-driven approaches [60], with more of an emphasis on leveraging available resources and capacities that could be sustainable in the longer term.

Officials highlighted the need for more bespoke technologies relevant to communities and that the 'one-glove-fits-all' concept does not apply. Initial investigations of the technology landscapes revealed the nuanced relationships that municipalities have with their communities and that existing means of public participation need not be replaced but enhanced to such a level that they are all-inclusive and consider the socio-economic needs of communities. In essence, officials feel that communities require user-friendly, low-tech platforms accessible through hand-held devices, such as cell phones, with low or no bandwidth requirements. In addition, there is a strong emphasis on ensuring trust in the system, particularly in protecting personal information, which reinforces the benefit of reusing existing platforms (where those are reliable). Some of these points have been echoed in our initial interactions with community members who are sceptical of using public platforms to air their views, such as budgeting processes, and they perceive a leaking of information that may potentially lead to victimisation. Clearly, more civic 'tech' education is therefore required on the pros and cons of technology adoption in the e-participation process. Such engagements also exposed generational dynamics typical of other contexts, as young people seem more accepting of new technologies than the elderly.

Many of the front-line civil servants involved in public participation have shown an interest in having more direct control over sourcing and using tools for communicating with residents, gathering inputs, and integrating data into planning processes. As these public participation officials are not technology specialists, the process of identifying and designing technology solutions has involved an incremental learning journey: First, available tools are tested, then, capacity and confidence increase, and then the willingness to explore more advanced technologies grows. This emphasis on hands-on learning is closely connected to collective peer-learning, discussed in the next section.

However, there are also potential drawbacks to this approach that the ePPMOSA project team are keeping in mind. One of these is the risk that we alienate IT departments and officials, who may see the adoption of 'rogue' applications and tools as a risk and cost. Moreover, the role of IT actors is likely to be important as (i) a tool scales to more internal users and public audiences with associated performance demands, (ii) technology needs become more complex, (iii) integration is required with other municipal systems, and (iv) immediate and long-term risks need more explicit management to mitigate against potential harms to users and costs for the municipality.

### *4.2. Local Peer-Learning as a Priority*

Closely connected to the above dynamic of user-driven innovation and learning-by-doing is a strong push from the partner municipalities to have more peer exchanges with other *local* municipalities and technology innovators. Officials involved in public participation emphasise that experiences and lessons from other municipalities are invaluable for guiding their e-participation initiatives.

The ePPMOSA project team has therefore reworked the allocation of resources to better support these peer-learning interactions. A key activity has been the hosting of two annual group workshops, mainly for partner municipalities but also for public participation officials from municipalities and provincial and national government entities not directly involved in the project, as well as selected international government and non-governmental organisations. The main objective of the group workshops was for municipalities to share experiences and lessons from previous technology implementations—as well as their experiences with low- or no-technology participation methods. In between group workshops, the project team has facilitated ad hoc, bilateral exchanges between municipalities to explore specific implementation models in more detail, and has supported workshops and toolkit development for sister initiatives that have similar objectives—such as SALGA's COMPACT project, which aims to support public participation and planning in local government—as a way to extend the knowledge-sharing network.

In general, there has been a preference for local over international exchanges. While in-person visits to international projects were seen as potentially valuable, there was concern that these visits would be limited to a few officials in the public participation or planning units, which would limit knowledge sharing and create a risk for pilot sustainability in the long term. In addition, local exchanges have allowed for engagement with peers navigating similar political, social, and technological challenges.

The ePPMOSA project team has also sought to connect another leg to the local exchanges by linking the group workshops to engagements with local civic tech and e-government innovators from outside government, mainly through the annual Civic Tech Innovation Forum (CTIF). The aim of this link has been to enable more serendipitous interactions between local officials and innovators.

Although much of this peer-learning and knowledge exchange has been directed towards external engagement, the more critical need is probably to support intra-municipality information sharing and collaboration. This echoes the risk noted above about innovation initiatives potentially (further) alienating other departments. As a result, in the pilot design and planning sessions, the ePPMOSA project team has encouraged involvement from other key departments—from relevant sector departments to IT, legal, procurement, and communications—to contribute their own views on what is needed and what has worked or not worked. This inclusive design process can go further, such as through a joint hackathon involving other departments or units, as implemented in one of the municipalities. Ultimately, the project team is conscious of the need for the design processes to involve the public as co-designers and to look for these opportunities as projects unfold.

### 4.3. Research Council as Action-Research Intermediary

From the above activities, it is evident that the ePPMOSA project team is playing the role of the e-participation design and implementation intermediary, linking different officials and external actors on various activities [45]. To a large extent, this role was explicit in how the original project scope was developed, but there has been some evolution in what exactly this mediation role involves. One of the earliest shifts was a change in the project team's orientation as an intermediary from gathering and consolidating municipality public participation challenges and 'requirements' (as something social science researchers are somewhat familiar with) towards facilitating municipality officials' identification of existing internal capabilities and available or appropriate technologies that could be adapted and incorporated into their practices.

Other intermediary functions were also modified. There is a stronger emphasis on brokering a more diverse spectrum of external (and internal) relationships to support the above learning processes. Also, the original plan to advise municipalities on suitable technology infrastructure to support an e-participation 'platform' implementation (likely with a municipality IT department) became less relevant with the shift in emphasis towards using existing and cloud-based applications and drawing more on user-driven innovation.

### 4.4. Political Endorsement and Politicisation of e-Participation

As initial engagements between ePPMOSA researchers and municipality officials progressed, there was a stronger recognition of how this project—within the wider set of VVISDP projects—is especially sensitive to and affected by informal and formal political interests. This is due to the potential impact that digital participation and (re-)intermediation can have on communication flows between the municipality officials, councillors, residents and other actors such as political party branches, ward committees, community organisations, and traditional leaders, amongst others.

Municipality involvement in the ePPMOSA project was achieved by application to the DSI and usually led by the municipal manager or planning office, which may have a more administrative or technology-related interest, but sometimes from the Speaker's Office, where public participation units are often located. The Speaker's Office is closer to the formal politics of the council.

Whether from the more administrative or more political space, the push to implement the project is theoretically coming from the municipality officials instead of from the DSI and ePPMOSA project team, and so there is implied demand for the project and less likelihood of resistance. The reality is that the lead applicant would often still need to enrol support from other relevant departments in the municipality, as well as from formal political stakeholders. Much of the focus for gaining approval across municipalities has been on introducing the project to senior management (such as through presentations to executive committees) or to councillors (such as by presenting to a councillors' forum).

Councillors and the council as a decision-making structure are particularly important for a number of reasons. These include approving new projects with external partners, communicating information to communities about new projects, and supporting and enabling changes to how communication flows between residents and communities take place. A key consideration for partner officials and the ePPMOSA project team has been how new technology implementations may (or may not) be integrated with and supported by councillor communication channels, such as ward-level WhatsApp broadcast lists or groups.

The project team has needed to consider how these formal and informal political dynamics can influence e-participation credibility and sustainability. First is the potential 'politicisation' of digital communications in a context where existing participatory or public engagement structures, like ward committees, are already highly politicised. Second is the fluid nature of political roles and communication arrangements which can affect the stability and consistency of e-participation implementation.

### 4.5. A System Perspective on Local e-Participation Innovation

The original objective and activities of the ePPMOSA project were framed by the DSI as a mix of national outcomes (such as establishing an e-participation platform for local government and a national forum for e-participation), which were quite prominent, and municipality-specific undertakings (such as researching existing local government e-participation practices and piloting the platform in a local environment) [59].

As the previous sections have described, there has been a strong pull—by local officials and the project team—towards a more decentralised and co-creative implementation approach [61], although still limited to government actors. This has been supported by DSI and may reflect a wider interest amongst national officials in mission-oriented [28] and transformative innovation policy approaches [29]. Under these innovation paradigms, the ultimate goal is transformative change in practices and outcomes at the national or global level, but this is achieved by encouraging decentralised experimentation that is directed and protected or nurtured by a wider system frame. This framing is also important because the DSI has positioned the VVISDP as supporting the implementation of the national District Development Model (DDM) which aims to connect planning across the different spheres of government [62]. Therefore, as a national (and international) initiative, whilst local adaptation is supported, the individual pilot projects must contribute to a broader system story within and between municipalities. As noted in the previous sections, this approach aligns strongly with most municipal officials' desire to connect with peers in other municipalities.

But there are other ways in which a system perspective has become relevant to the project. First is how the pilot projects are positioned with respect to existing or other e-participation initiatives in a municipality. In most contexts, there is an existing website or social media channels which tend to reach certain audiences, often more affluent or older individuals. During the ePPMOSA pilot design, public participation officials have generally sought to identify non-participating groups, especially young people, who are recognised as needing different types of information, digital channels, and incentives to participate. So, the pilots tend to be slightly (or potentially quite far) displaced from existing tools with a view to gaining new learnings that can be used to shape more inclusive approaches to e-participation. The project team has also sought to be more explicit about where the current and planned e-participation sit, and relate to each other, within an e-participation 'stack' made up of various horizontal and vertical layers [63,64]. The idea here is to better define the elements and the interconnections, in a practical way, that can make up sustainability e-participation initiatives.

### 4.6. Sustainability and Scaling: From Administration to Ecosystem

Municipalities are cognisant of the importance of planning for the sustainability of the e-participation process beyond the pilot end. Many officials have worked with previous pilots and experienced frustration in not being able to take promising initiatives forward, largely it seems because of administrative challenges associated with a quite restrictive technology acquisition environment. Some broader considerations for sustainability and scalability that are prominent include the following:

- Motivating for support and approval: The research team engaged mainly with municipal officials from the public participation and planning departments, and in some instances, municipal IT experts. Whilst IT support appears to be more low-key than what would have been the case ten or twenty years ago, the endorsement of senior officials continues to be critical, such as Executive Management Committees, the municipal manager, and even mayors and especially the council.
- Budgeting and acquiring technology: Municipalities have been aware that some technologies would need to be budgeted for post-piloting if they would like to continue using them. Whilst identifying low-cost options has become central to the project, to the extent that it is shaping much of the wider approach to implementation, there are likely to be administrative challenges in even small-scale acquisitions due to the difficulties officials face in technology procurement in many public sector environments. The partnership with the ePPMOSA project team will therefore need to work through these processes and support supply chain (and IT) engagements during the post-pilot transitions. Alternative models of funding and procuring technology also seem to be important, given small existing budgets for this area and the possibility that external partners may be willing to help scale promising pilots.
- Shared ownership and responsibility: Although the starting point for this project has been researchers working with officials, there is recognition amongst the project team and municipality partners that the tools and the processes need to be seen as a shared resource within communities. This aligns with the more traditional expectations of a co-design process, but extends to how the wider gov tech/civic tech ecosystem can shape design processes and involvement of a wider diversity of stakeholders—and how these top-down government pilots may interface to bottom-up actions coming from other sectors as well as from other municipal departments (as both a challenge and opportunity). This is closely linked to the system view noted earlier. The project team regularly reflects on how this may be achieved within the (adapted) scope of the original project framing.
- Multiple transition pathways: With such projects, the partners often get locked into the idea that the pilot that was performed must be sustained or scaled. However, there do seem to be other ways of looking at the transition pathways. One of these is to see themselves as part of a community of practitioners that can draw on technologies and practices tested in other municipalities. Another is to see the pilot as a personal learning and confidence-building process that equips (non-technical) officials to engage more effectively with other projects within the municipality or externally that are being initiated or scaled or that could be augmented to serve their needs.

## 5. Discussion

### *5.1. Theoretical Implications*

Reflecting on the results, there are several areas where we have started to see some theoretical implications related to e-participation design and implementation, or where there are potential avenues for theoretical contributions going forward:

1. *Empowerment and agency of public officials:* The project emphasises facilitating the agency of public participation officials and empowering them to construct their socio-technical environment. Whilst the focus on empowering public officials does seem to overlook the need to involve citizens in the co-design process, at the same time, this approach recognises that agency and empowerment are built across a system and that 'reformists' in government are critical for ensuring ICTs improve organisational responsiveness within that system [65]. Part of empowerment is how (non-technical) officials develop the confidence and awareness to engage and interface with citizens

in co-design activities, but also with similar initiatives by other departments or units in the municipality, and with bottom-up e-participation projects by non-government actors. So, an underexplored area of agency and empowerment for officials (and researchers) may be a willingness to let go of their own project and join another.

2. *More direct control over technology:* The empowerment of, especially, front-line civil servants is partly enabled by more direct control over technology by users. This includes actively involving officials in technology selection and prototyping and facilitating peer-learning between public participation units in different municipalities about how tools can be used. It also reinforces findings from other studies about sourcing malleable technologies with limited 'inscription' of standard workflows and high 'divisibility' that can be adapted, assembled, and replaced over a longer period of time [5]. However, there are implications for technology integration, governance, and sustainability and a risk that 'user' abilities are over-romanticised.
3. *Multiple perspectives and transition pathways:* As each of the pilot projects is somewhat 'displaced' in different parts of the e-participation stack, and targeting different municipal or public users, there are potential opportunities for conversation and learning to bring together unique lessons from across the system. This can elicit ways in which digital engagement can be more inclusive and sustainable [66], but also support an openness to alternative transition pathways post-pilots as noted above. This looks to be an area for improving our understanding of sustainability.
4. *Alignment with mission-oriented and transformative innovation policy thinking:* The activities of public participation officials within municipalities form part of a wider national community of (e-)participation practitioners and reflect some aspects of what the DSI has been promoting around mission-oriented and transformative innovation thinking [67]. However, there is a need to look at a wider array of system dynamics, including the interconnection between specific technology and social components, which could contribute a deeper understanding of how a socio-technical ensemble (and its change) influences transformative changes at a wider level, from practice and policy perspectives [10].
5. *Role of researchers and other intermediaries:* Broadly, the research partner's role as an intermediary has evolved to empower front-line planning and public participation officials in the design and use of technology, and included redirecting resources towards peer-learning and similar activities. This reduced the researcher's 'vanguard' role and allowed for more municipality-led processes of knowledge acquisition and implementation, and co-production across the project and network of participants [30]. This reflects broader discussions in public administration scholarship about the role of intermediaries in co-production between service users and public service providers [68].

### *5.2. Implications for Policy and Practice*

The theoretical implications are intertwined with what is relevant to policy and practice, but it is worth highlighting certain points. First is that it is crucial to note that the impact of e-participation on local governance outcomes depends on several factors besides technology design, user education, and change management in a traditional organisational sense, such as the attitudes of politicians towards the public, the framing of the e-participation platform objectives within the local socio-political context, existing levels of engagement and participation by citizens, and a much wider, system view in managing the e-participation process. This has meant that stakeholder engagement takes on a new level of importance in designing and implementing e-participation platforms. Nonetheless, the underlying imperative is to understand the needs of municipality officials as to why and

how they want to engage with their communities using electronic platforms (aside from the same understanding of what communities are seeking).

Moreover, whilst traditional needs analysis exercises are needed to identify the specific e-participation requirements of municipalities and their communities, they should be followed by prioritising concepts based on feasibility and anticipated impact to ensure the most relevant solutions are piloted. It is crucial that we continue to involve municipal officials and carefully identified stakeholders in the design and implementation of e-participation technologies. This is important for ensuring that the technology is integrated into daily practices and that there is buy-in from all parties involved, which will assist in mitigating resistance to implementation and adoption.

Going forward, community consultation and feedback (and ideally co-design) are an important step to gaining insights that can inform the development and understanding of the effectiveness of e-participation prototypes. As a minimum, feedback will assist in the refinement of the technology or e-participation tool so that it meets the needs of the users and the requirements of officials.

The initial observations outlined in the results also highlight a range of other activities that practitioners may consider in the design of similar projects including intentionally prototyping in different user communities or technology spaces and integrating lessons, exploring the use of malleable technologies (whilst recognising the need to manage safety and plan for future integration), explicitly building the socio-technical agency of public participation officials, facilitating regular peer-learning across the system, and building awareness and confidence to engage with adjacent projects.

## 6. Conclusions

This paper details the implementation of e-participation pilots in South African municipalities through the lens of the ePPMOSA project. By reflecting on our own research experiences and observations of public officials driving participatory governance in local government, we investigate how various co-design and bricoleur practices shape digital technology adoption in support of broader organisational and social change. Looking at the interaction of public officials, technology, and institutional practices, we have considered what could lead to successful outcomes when implementing e-participation projects.

### *6.1. Key Observations and Implications*

This multi-year applied research initiative differs from previous e-participation initiatives in six significant ways. First, while many e-participation projects focus primarily on technology deployment, ePPMOSA emphasises the role of public officials as active innovators and bricoleurs, enabling them to shape and adapt digital solutions to local needs and practices. Successful e-participation implementation requires a nuanced understanding of local contexts and existing participatory mechanisms. Integrating digital tools must enhance rather than replace traditional participation methods, particularly in communities with varying levels of digital literacy and access. Second, unlike initiatives that prioritise external expertise, ePPMOSA facilitates peer-learning networks among municipalities, fostering sustainable knowledge exchange and capacity building. Third, the project's flexible, multi-phase approach allows municipalities to experiment with existing technologies before committing to more complex solutions, contrasting with conventional approaches that often begin with large-scale technology implementations. An important extension of this is how public officials, acting as socio-technical bricoleurs, can creatively combine existing resources and digital tools to foster sustainable e-participation solutions. Fourth is the appreciation for our evolving role as researchers towards knowledge brokers and, in future, a sensitivity to the role of researcher intermediaries in co-design processes involving

citizens, ultimately underpinned by a trust-building process with involved stakeholders. Fifth is our analysis suggesting that the sustainability and scalability of e-participation initiatives rely on several critical factors including sufficient budgeting for technology maintenance and planning administratively for the acquisition process, transparent distribution of responsibilities, ongoing capacity building, robust institutional support, and an awareness of multiple possible transition pathways. Finally is the importance of a system perspective in how the ePPMOSA project is positioned (and how pilots are nurtured) within a wider policy narrative, in how prototypes may be tested and lessons transferred or integrated, and in how learning takes place. These dynamics highlight the intricate interaction among social, technical, and institutional elements in accepting e-participation.

The theoretical implications of our findings contribute to the growing body of literature on socio-technical systems theory in public sector innovation through a number of lenses. This paper provides insights into participatory design as a tool for fostering citizen engagement, emphasising co-design processes and the importance of involving diverse stakeholders in the design and implementation of e-participation systems. Building on the bricolage concept, we see that successful e-participation implementation in Global South (or resource-constrained) municipalities is likely to depend on creative adaptation and recombination of existing resources rather than wholesale adoption of standardised solutions. By adopting the position that municipal officials act as bricoleurs in implementing e-participation initiatives, we moved away from traditional top-down, technology-driven approaches to digital governance and instead draw on socio-technical systems theory to argue that effective e-participation emerges from the complex interplay between social, technical, and institutional factors within specific local contexts. Ultimately, we show how this framework can be applied to understand and support the implementation of digital governance tools in resource-constrained environments.

### *6.2. Limitations and Critical Reflections*

As the ePPMOSA project and associated pilots are at a relatively early stage of implementation, these observations reflect what has taken place during initial engagements, design discussions, smaller-scale testing and prototyping, and knowledge exchanges about what has been performed previously. As a result, the findings point to what is emerging from a design perspective and associated practices. In addition, the results are our own reflection as researchers and are therefore likely to be shaped by our own interests and beliefs in how e-participation technology may be implemented and used. In future phases of the action-research cycle, we anticipate exploring the experiences and perspectives of public officials, community members and other stakeholders to develop a richer picture of e-participation in a diversity of municipal contexts.

From a project implementation perspective, a key shortcoming is the concentration on e-participation as a government-led programme and the work of public officials. This creates risks for wider adoption, both because there is limited stakeholder buy-in from an early stage but also for ensuring that the features and information provided align with what community members actually need. Moreover, while the project's emphasis on local adaptation and bricolage promotes sustainability and ownership by front-line officials involved in public participation, it may offer difficulties in interfacing, standardising and scaling within the wider municipal organisation. Understanding how to balance local adaptation with the need for standardisation is also an area for future exploration.

In summary, e-participation is an effective process for municipalities to interact with communities, young and old, if well implemented [10]. Our initial efforts at designing and implementing pilots with municipalities have confirmed that effective e-participation ultimately depends on technology fitting in with a wider, people-driven solution to pub-

lic participation challenges. It is well known that the design and implementation of e-participation technology should be participatory, ensuring that public officials, underrepresented communities, and diverse publics can shape its implementation. The focus of ePPMOSA has been on empowering public participation officials which has provided new insights into the role and practices of civil servants in shaping e-participation implementation. At the same time, this has raised questions about wider involvement from a participatory design perspective and the implications for immediate adoption of pilots and sustainability in the longer term.

In future phases of work, one of the key areas of interest, as part of the ePPMOSA project and beyond, is to explore the way in which community members or citizens draw on technology to drive bottom-up e-participation initiatives, which can either compete or collaborate with ones initiated by the government or other actors [69]. Mobilisation from the bottom up tends to blend various online and offline methods and tools, often focusing on specific issues such as public health services [70]. A key requirement for civic-led action is the ability to build social capital within a community, whether locally or geographically distributed. This capital is critical for meaningful engagement with policy processes, and early studies of the internet highlighted how online forums can strengthen cooperation but that this needs to be complemented by offline interaction [11]. Research has shown that social forces, like the development of strong bonds and a sense of community, exert positive and significant effects on political efficacy and political trust [59]. However, whilst there has been growth in bottom-up processes, much of the literature, practice, and policy on e-participation tend to be focused on top-down or government-led activities. There is, therefore, a critical need to consider how our findings (and associated practices) related to public officials intersect with civic-led action, and also how public entities may relate to conversations taking place in online fora outside their direct control [10].

This paper has considered how sustainable e-participation initiatives in resource-constrained settings can be achieved through locally driven experimentation, supported by peer-learning networks and research partnerships. By reflecting on our participatory, adaptive approach, the paper points to the need for specific design and project management actions that can unlock the transformative potential of digital tools in fostering more inclusive, citizen-centric governance. The emerging lessons provide insights for municipalities in the Global South for localised, collaborative, and innovative strategies to enhance digital governance.

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