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Artificial Intelligence for Citizen-Centered Smart Governance: Enhancing Participation and Territorial Decision-Making

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ABSTRACT

This article examines how artificial intelligence (AI) could support citizen-centered smart governance and territorial decision-making in Rabat, Morocco. It draws on a doctoral study of territorial intelligence that included questionnaire responses from 349 participants. The original survey did not measure AI adoption or evaluate an AI system; AI is therefore treated as a prospective decision-support capability, while the empirical analysis reports citizens' perceptions of governance and participation. In the item-level results, 24.4% of valid responses agreed that citizens were involved in decision-making, compared with 52.0% who disagreed. For the statement that smart-territory decision processes were participatory and inclusive, 29.3% agreed and 31.9% disagreed; 27.0% were neutral. A further 40.2% disagreed that citizens were informed and consulted about territorial projects and policies. These descriptive findings indicate a participation and communication gap that should be addressed before AI tools are introduced into local decision processes. Building on the survey evidence and current research on AI in participatory planning, the article proposes a human-led framework in which AI may help translate, classify and map public input, while public authorities retain responsibility for decisions. Accessibility, privacy, transparent explanations, human review and opportunities to contest outputs are treated as design requirements. The framework is conceptual and requires local co-design and empirical evaluation.

Keywords: artificial intelligence, smart governance, citizen participation, territorial intelligence, urban decision-making, Rabat, Morocco

1. INTRODUCTION

Urban authorities increasingly rely on digital information to coordinate services, plan infrastructure and respond to residents. In this setting, smart governance concerns more than the installation of digital systems. It also concerns how public institutions make decisions, share information, include affected groups and remain accountable. The case of Rabat is useful because the supplied doctoral study places citizen-centered territorial intelligence at the intersection of information and communication technologies (ICT), human factors, governance and urban development.

Artificial intelligence can extend these digital capacities. For example, natural-language tools can help public agencies sort large volumes of consultation responses, translate submissions, identify recurring concerns and connect resident input with spatial information. These capabilities may help planners work with complex, multilingual and geographically distributed feedback. Recent research on participatory urban planning identifies possible uses of analytical AI for summarising plan information and analysing citizen feedback, while also identifying risks involving privacy, errors, misinformation and the transfer of decision authority to automated systems (Raymond et al., 2025). A multidisciplinary review further cautions that AI-enabled participation can remain procedural or technocratic unless the public can meaningfully influence decisions and challenge the distribution of power (Sieber et al., 2025).

The empirical material in the thesis places a specific constraint on the claims of this article. The questionnaire measured perceptions of territorial intelligence, ICT, governance and participation; it did not measure AI awareness, AI use, trust in algorithms or the effects of AI-mediated participation. Accordingly, this article does not estimate an AI effect. It uses the Rabat findings to identify local governance needs and develops a cautious framework for how AI might support, rather than replace, citizen voice and public deliberation.

The article addresses three questions: (1) What participation-related concerns are visible in the Rabat questionnaire results? (2) Which governance functions could AI plausibly support in response to those concerns? (3) What safeguards would be necessary to ensure that AI-assisted decision support remains inclusive and accountable? Its contribution is a case-grounded framework connecting empirical evidence on participation with design requirements for future AI-enabled territorial governance.

2. LITERATURE REVIEW

2.1 Citizen participation in smart governance

Participation ranges from one-way information provision to shared agenda-setting and decision authority. The distinction matters because digital consultation can make engagement more convenient without changing who frames problems, whose evidence counts or how decisions are made. Arnstein's (1969) participation ladder remains a useful reminder that participation mechanisms differ in the degree of citizen power they confer. For smart governance, a platform or consultation channel should therefore be assessed by the influence it gives residents, not only by the number of submissions it collects.

Smart-city scholarship similarly treats governance as an institutional and social process rather than a technology layer. Gil-Garcia, Pardo and Nam (2016) describe smart-city development as involving technology, people and institutions. This perspective is relevant to Rabat: the thesis associates ICT with social and human dimensions, while its descriptive governance findings show that digital readiness alone does not guarantee perceived citizen involvement. A participatory system needs accessible channels, meaningful opportunities to shape agendas and a visible account of how input affected the final decision.

2.2 AI as an aid to participatory territorial planning

AI systems may assist at several points in a planning cycle. Analytical methods can classify submissions, identify repeated themes, extract place names, detect emerging concerns or help compare alternatives. Generative systems may help translate or simplify planning documents, draft summaries and create visual scenarios. Du et al. (2024) review AI-enabled participatory planning and describe a growing range of planning applications. Raymond et al. (2025) distinguish analytical, generative and humanised AI and show that each form raises different opportunities and risks. These functions are best understood as support for information handling and deliberation, not as authority to determine public priorities or allocate public resources.

The democratic value of AI-assisted participation remains contested. Sieber et al. (2025) identify multiple pathways through which AI and participation intersect, including participation that accompanies automation, participation mediated by AI, participation reduced to quantification and more meaningful forms involving public influence. Their analysis highlights power differences and the possibility that citizen-centred rhetoric can coexist with expert control. Thus, the relevant design question is not simply whether AI can

process more feedback, but whether that processing makes participation more representative, intelligible and consequential.

2.3 Governance and safeguards

Responsible public-sector AI requires institutional accountability over the whole system life cycle. UNESCO's Recommendation on the Ethics of Artificial Intelligence calls for privacy protection, explainability, accountability, audit and human oversight, including inclusive public oversight where appropriate (UNESCO, 2022). The OECD's Digital Government Outlook 2026 likewise reports that public-sector AI governance is expanding but operational controls, impact measurement and sustained user feedback remain uneven (OECD, 2026). These principles are directly relevant to local planning because residents need to know when AI is used, what information it processes, how its outputs inform a decision and how an error or disagreement can be corrected.

For a city such as Rabat, safeguards must also address unequal access to digital participation. An AI-supported online channel could improve translation and reduce administrative burdens, yet it could exclude residents with limited connectivity, digital skills or accessible devices if it becomes the only route to contribute. Maintaining in-person, telephone and paper channels is therefore part of the participation design, not a temporary workaround. Human review must also examine whether the system underrepresents neighbourhoods, languages or groups whose contributions are less frequent or harder to classify.

3. CONCEPTUAL FRAMEWORK AND PROPOSITIONS

The proposed framework treats AI as an intermediary between citizen input and public decision-making. It has five stages: (1) residents provide feedback through online and offline channels; (2) AI may assist with translation, classification, summarisation and spatial aggregation; (3) public officials and community representatives review the outputs in an inclusive deliberative process; (4) the responsible authority makes and explains the decision; and (5) residents receive feedback and have an avenue to question or correct the record. The authority remains accountable at each stage.

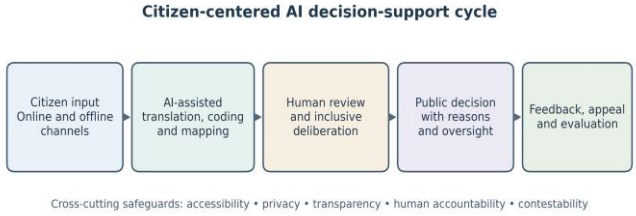

Figure 1: Proposed citizen-centered AI decision-support cycle for territorial governance.

The framework is informed by the thesis findings on low perceived involvement and consultation, and by the literature on meaningful participation and trustworthy AI. It is a design proposition, not a tested causal model. Its central propositions are:

P1. AI-assisted translation, summarisation and classification may reduce information-processing barriers in public consultations when residents can contribute through accessible online and offline channels.

P2. The legitimacy of AI-assisted territorial decisions depends on transparent human review, public explanations and a clear record of how citizen input informed the decision.

P3. Participation becomes more meaningful when residents can correct misclassified input, contest the use of AI-generated summaries and receive a reasoned response from the responsible authority.

P4. AI-assisted participation may reproduce existing inequalities if training and consultation data underrepresent particular neighbourhoods, languages or social groups; inclusion monitoring and non-digital participation routes are therefore necessary.

4. METHODOLOGY

4.1 Study design and empirical source

This article presents a secondary, descriptive analysis of governance and participation results reported in the supplied doctoral thesis on territorial intelligence and territorial development in Rabat. The thesis reports a questionnaire survey with 349 respondents. The questionnaire used agreement items on governance and public participation; the annex lists a five-point Likert response scale, while the results tables also provide a "do not know" category. Item-level valid responses are generally 348, with one missing response. The available thesis copy does not clearly report the survey date, sampling frame, recruitment procedure, response rate or

respondent demographic profile. These details are therefore not inferred here.

The article focuses on four directly relevant items: citizen involvement in decision-making; participatory and inclusive decision processes; support for citizen participation initiatives; and whether residents are informed and consulted about territorial projects and policies. Frequencies and valid percentages are transcribed from the thesis tables. Because the raw respondent-level dataset was not supplied, the analysis does not recalculate the estimates, conduct subgroup tests or fit a new statistical model.

4.2 Measurement and analysis

The thesis reports a governance-scale Cronbach's alpha of .796 and a Kaiser–Meyer–Olkin statistic of .834 for the governance items, with Bartlett's test $\chi^2(10) = 460.270$, $p < .001$. These reported values support factorability and internal consistency for the governance scale as documented in the thesis; they do not independently validate the separate participation items for this article. The present analysis is descriptive and item-level. It reports the observed response distributions and uses them to motivate a conceptual framework for AI-assisted participation.

The thesis also reports structural equation model estimates for a broader model linking ICT, human factors and territorial subsystems. However, the model-fit table reports $\chi^2/df = 22.947$ and RMSEA = .251. These values indicate serious fit concerns and conflict with the thesis narrative describing the model as acceptable. The SEM paths are therefore not used as evidence for the claims in this article. Re-estimation would require access to the raw data and verification of the measurement and structural model specifications.

4.3 Ethical and reporting considerations

The source report describes the questionnaire as academic research but the supplied copy does not identify an ethics committee, approval number, approval date or consent procedure. This article does not claim that such approval was obtained or waived. Before journal submission, the authors should verify the applicable institutional ethics determination and report consent, data-protection and data-sharing procedures accurately. No individual-level records are reproduced here.

5. RESULTS

5.1 Perceived citizen involvement

For the statement "Citizens are involved in the decision-making process of the smart territory," 52.0% of valid responses disagreed or strongly disagreed. A further 18.4% were neutral, 24.4% agreed or strongly agreed, and 5.2% selected "do not know." Thus, fewer than one in four valid responses expressed agreement that residents were involved in decision-making.

5.2 Participatory processes and consultation

For the statement that decision-making processes were participatory and inclusive, 31.9% disagreed and 29.3% agreed; 27.0% were neutral and 11.8% selected "do not know." On the item asking whether citizens were informed and consulted about projects and policies, 40.2% disagreed, 27.3% agreed, 23.3% were neutral and 9.2% selected "do not know." The pattern suggests that communication and consultation were particular points of concern in respondents' assessments.

5.3 Support for participation initiatives

For the statement that citizen participation initiatives were supported and encouraged, 34.5% disagreed, 29.9% agreed, 25.0% were neutral and 10.6% selected "do not know." The responses do not indicate a uniform rejection of existing initiatives; instead, they show a divided assessment with a substantial neutral group and a larger share of disagreement than agreement.

Table 1: Valid response distributions for participation-related items reported in the thesis.

Questionnaire item	Disagree	Neutral	Agree	Do not know	Valid n
Citizens involved in decision-making	52.0%	18.4%	24.4%	5.2%	348
Decision processes participatory and inclusive	31.9%	27.0%	29.3%	11.8%	348
Citizens informed and consulted on projects and policies	40.2%	23.3%	27.3%	9.2%	348
Participation initiatives supported and encouraged	34.5%	25.0%	29.9%	10.6%	348

Note. “Disagree” combines “strongly disagree” and “somewhat disagree”; “Agree” combines “somewhat agree” and “strongly agree.” Percentages are valid percentages reported in the thesis and may not sum to 100 because of rounding.

6. DISCUSSION

6.1 What the Rabat findings imply for governance design

The most direct finding is that perceived citizen involvement in decision-making is limited: 52.0% of valid responses disagreed that citizens were involved, compared with 24.4% who agreed. The reported disagreement was also substantial for information and consultation (40.2%). These results should be read as perceptions of the respondents in this thesis survey, not as a representative estimate for all residents of Rabat, because the sampling frame and recruitment method are not documented in the available copy. Even with this limitation, the response pattern identifies a practical governance problem for future smart-territory initiatives: residents may not see how their input reaches decision makers.

AI may help address specific administrative bottlenecks. Translation and plain-language summarisation could make planning documents easier to access. Classification and deduplication could help officials review large consultation volumes. Geospatial aggregation could help identify where concerns cluster, provided that the analysis preserves privacy and does not treat frequency as a proxy for need. These use cases align with the possibilities identified in recent participatory-planning research (Du et al., 2024; Raymond et al., 2025). They remain proposed functions for Rabat, not systems evaluated by the underlying survey.

The findings also warn against equating digitised input with participation. A machine-generated summary may make thousands of comments easier to read, but it can obscure minority views, disagreement and the reasons behind a response. If public authorities receive only the model’s summary, residents may lose direct influence over how their concerns are framed. A meaningful process should preserve access to the original submissions for authorised review, disclose how summaries were produced and permit residents or community groups to correct material errors. Public authorities should publish a response that links key concerns to decisions and explains why some proposals were not adopted.

6.2 Proposed safeguards and evaluation

The framework implies five safeguards for any pilot in Rabat. First, AI should support analysis and communication, while the relevant public authority retains decision authority and legal responsibility. Second, participation must remain multichannel so that residents are not required to use an AI interface or online platform to be heard. Third, the system should provide clear notice of what AI does, what data it uses and how outputs enter the decision process. Fourth, human reviewers should examine classification errors, missing groups and differences across neighbourhoods and languages. Fifth, the process should include feedback, correction and contestation mechanisms.

Evaluation should measure both system performance and democratic quality. Technical measures could include translation accuracy, classification agreement, error rates by language, and the proportion of submissions that receive human review. Participation measures could include who participates, which channels they use, how representative the contributions are across neighbourhoods and demographic groups, and whether participants receive a response. Governance measures could track the share of recommendations receiving a reasoned answer, changes made after public input, correction requests resolved, and residents’ understanding of how their data were used. These indicators are proposed for future evaluation; they were not measured in the thesis.

This approach is consistent with international guidance stressing explainability, privacy, accountability, audit and human oversight (UNESCO, 2022). It also responds to OECD findings that user feedback, impact measurement and operational controls remain less developed than high-level AI strategies in many governments (OECD, 2026). For local governance, the practical implication is to define the public purpose and participation rules before selecting or procuring an AI tool.

6.3 Theoretical contribution

The article connects territorial intelligence with meaningful participation in AI governance. Territorial intelligence in the thesis is conceived as an interaction among ICT, human factors and social, economic and physical subsystems. The proposed framework adds a procedural account of how AI could mediate between resident knowledge and territorial decisions, and specifies conditions under which that mediation can support rather than narrow citizen influence. This shifts the analytical focus from whether a city uses AI to whether residents can understand, shape and contest the use of AI in decisions that affect their territory.

7. LIMITATIONS AND FUTURE RESEARCH

Several limits constrain the conclusions. The source thesis does not provide the survey date, sampling frame, recruitment method, response rate or demographic profile in the sections available for this analysis. Item percentages therefore describe the reported valid responses and should not be generalised to the full population of Rabat. The raw dataset was unavailable, preventing independent verification, re-estimation, subgroup analysis and testing of a participation-specific measurement model. The thesis does not measure AI adoption, AI trust, algorithmic literacy or the effects of AI-supported participation. The framework is consequently conceptual and not a tested intervention.

Future work should first verify and document the original survey methods and, where possible, reanalyse the respondent-level data using clearly specified measurement models and appropriate fit diagnostics. A second phase could co-design an AI-assisted consultation prototype with residents, civil-society organisations and municipal staff. The prototype should be tested across languages, neighbourhoods and online and offline channels, with a pre-registered evaluation of usability, representativeness, trust, decision traceability and the treatment of minority views. Comparative or longitudinal studies could then examine whether AI-supported feedback changes the quality of participation and the responsiveness of territorial decisions.

CONCLUSION

The Rabat questionnaire results report a clear gap in perceived citizen involvement: 52.0% of valid responses disagreed that citizens were involved in smart-territory decision-making, while 40.2% disagreed that they were informed and consulted about projects and policies. These findings provide a local basis for considering how AI might support participation, especially through translation, summarisation and analysis of public input. They do not show that AI has been used in Rabat or that it improves governance. The proposed framework therefore assigns AI a limited support role and keeps public authorities responsible for decisions. Any future use should be co-designed with residents, preserve non-digital channels, make AI use visible, protect personal data and allow people to correct or contest outputs. The central question for future evaluation is whether AI makes participation more consequential and inclusive for Rabat's residents.

DECLARATIONS

Ethics approval and consent to participate: The source thesis copy supplied for this article does not identify an ethics approval body, reference number or consent procedure. The authors should verify and report the applicable institutional determination before submission.

Data availability: The thesis tables provide aggregate response distributions. The underlying respondent-level dataset was not supplied with the thesis copy used to prepare this article.

Funding: No funding information was reported in the supplied thesis copy.

Competing interests: The supplied thesis copy did not include a competing-interest declaration; the authors should confirm this statement.

Author contributions: To be completed and approved by the article's authors.

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