



Community Participation in Local Governance During Industry 4.0 and Society 5.0: Lampung Province

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Abstract

Purpose: This study examines how community participation can be strengthened in the administration of local government in Lampung Province as digital technologies associated with Industry 4.0 and Society 5.0 reshape the delivery of public services.

Research Methodology: A qualitative policy analysis design was applied. Four policy alternatives were formulated from problem identification, then assessed against four criteria, namely effectiveness, cost, ease of implementation, and impact on community participation, using documentary sources, regulatory texts, and forty recent journal articles as evidence.

Results: Strengthening digital literacy, developing information technology infrastructure, and optimising e-government and smart city implementation each scored high on effectiveness, yet they differed sharply in cost and in how directly they touched participation. Digital participation scored lowest on cost and highest on ease of implementation while still producing a high participation impact.

Conclusions: No single alternative is sufficient. A combination of digital literacy strengthening, e-government and smart city optimisation, and digitally based participation offers the most balanced route to responsive local governance.

Limitations: The analysis relies on secondary material and normative assessment rather than primary survey data, so the scoring reflects informed judgement instead of measured citizen behaviour.

Contributions: The study offers regional administrators a defensible ranking of participation-oriented digital policies and extends the e-participation literature into a provincial Indonesian setting that remains thinly documented.

Keywords: Digital Literacy, E-Government, Local Governance, Public Participation, Society 5.0

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1. Introduction

Government offices in Indonesia look different than they did a decade ago. Queues that once wrapped around service counters have thinned, forms that once travelled between desks in paper folders now move through servers, and residents who once took a day off work to renew a document increasingly do it from a phone. The change is not cosmetic. It reflects a deeper reordering of how public authority organises itself, driven by the cluster of technologies that the Fourth Industrial Revolution brought into ordinary administrative life: the internet of things, artificial intelligence, large-scale data processing, cloud infrastructure, and automated workflows. Governments that once measured their performance by the volume of files processed are now judged on how quickly, how transparently, and

how accountably they serve citizens who compare public services against the digital services they use every day. Research on regional readiness for Industry 4.0 in Indonesia has shown that this comparison is unforgiving, and that local governments frequently lag behind citizen expectations in matters of integration, flexibility, and the socialisation of new services ([Sobari et al., 2023](#)).

Out of this pressure came electronic government, understood as the use of information and communication technology to improve public service delivery and to reshape the relationship between the state and its citizens. What began as a matter of putting information online has become an infrastructure question, a data governance question, and increasingly an artificial intelligence question, as agencies experiment with connected sensors and machine learning to anticipate demand rather than merely respond to it ([Al-Ansi et al., 2024](#)). Studies of citizen adoption in Indonesia have consistently found that the technical availability of a service explains far less about its use than perceived usefulness, ease of use, system quality, and the sense that the platform will treat personal information responsibly ([Sabani et al., 2023](#)). Adoption, in other words, is a social outcome rather than a technical one.

Indonesia has given this agenda a formal architecture through the Electronic-Based Government System, known nationally as (*Sistem Pemerintahan Berbasis Elektronik/SPBE*), which binds ministries, agencies, and regional governments into a shared framework covering policy, governance, management, infrastructure, and services. Analysis of the framework's contribution to accessibility indicates that it has widened the reach of public services, particularly for residents who previously had to travel considerable distances to reach an office ([Choirunnisa et al., 2023](#)). The same framework, however, exposes uneven capacity between regions, and its harmonisation across levels of government has been described as a prerequisite rather than an accomplishment ([Hadi & Widnyani, 2024](#)). A province with strong political commitment but weak network coverage will still record a modest SPBE score, and residents will still experience a service that fails at the last mile.

Population administration has been the most visible arena of this transformation. The electronic identity card introduced a nationally integrated identity number that now underpins access to health services, education, social assistance, and a widening range of transactions. Its successor, digital population identity, moves the credential onto the citizen's own device. Field studies of Indonesia's Electronic Identity Card (*Elektronik Kartu Tanda Penduduk/e-KTP*) issuance report meaningful gains in processing time once administrative workflows were redesigned around the electronic record rather than simply digitised on top of paper procedures ([Farida & Ambarwati, 2023](#)). Yet the shift also relocated risk. When identity data sits in a national repository and is accessed through consumer devices, protection of that data becomes a service quality issue rather than a back-office concern, and research on digital identity implementation has flagged precisely this tension between convenience and security ([Permadi & Rokhman, 2023](#)). Local registration offices, meanwhile, report that activation rates depend heavily on how well field officers explain the system to residents who have no prior experience of digital credentials ([Salopah et al., 2024](#)).

Alongside e-government and digital identity, the smart city concept has entered Indonesian regional planning as a way of organising these separate initiatives into a coherent development approach. Its promise is not simply that a city will contain more technology, but that governance, environmental management, and civic involvement will improve together. Analysis of smart city strategy in Indonesia suggests that the concept works best when it is treated as a service standardisation project rather than a procurement exercise, since digitising a badly designed procedure only makes its defects faster ([Viola & Fitrianto, 2022](#)). Implementation studies from Bandung reach a similar conclusion, noting that the visible applications rest on far less visible work in interoperability and process redesign ([Sofyan, 2024](#)).

Society 5.0, first articulated in Japan, pushes the argument one step further by placing human beings rather than industrial productivity at the centre of technological development. In this framing, technology earns its legitimacy by solving social problems, and a public service that is efficient but exclusionary has failed on its own terms. For regional governments the implication is direct: services

must be innovative, inclusive, and grounded in what residents actually need, which cannot be established without listening to them.

This is where participation enters the argument. Community participation is not decoration on top of good governance, it is one of its constitutive elements. Policies designed without public input tend to solve problems that officials perceive rather than problems that residents experience. Where citizens take part in planning, implementation, and oversight, accountability improves because someone outside the bureaucracy is watching. Longitudinal work on e-participation in Indonesia traces a gradual movement from information provision toward genuine consultation, though the pace has been uneven and the deeper forms of participation remain rare ([Wijaya et al., 2022](#)). Digitalisation itself has been shown to widen the circle of people able to contribute to decisions that were previously the preserve of those who could attend meetings in person ([Harahap & Harahap, 2023](#)).

Lampung Province has moved in this direction. The provincial government has implemented SPBE, developed online administrative services, used official social media channels to communicate with residents, and built digital public service platforms intended to increase transparency, speed up administration, and widen access. The progress is real. So are the obstacles. Information technology infrastructure remains limited in parts of the province, digital literacy among residents is uneven, internet access differs markedly between urban centres and rural districts, and the security of digital data raises concerns that residents voice in their own terms even when they lack the vocabulary of data protection. National assessments of digital literacy describe a population that can operate devices but is markedly weaker in the security dimension, which is exactly the dimension that matters when citizens are asked to trust a government platform with their identity ([Afrina et al., 2024](#)). Similar work connects low digital literacy to vulnerability in the broader information environment, with consequences for the quality of public deliberation ([Bulya & Izzati, 2024](#)). Constitutional analysis of privacy guarantees during government digitalisation adds a further layer, arguing that the state's duty to protect personal data intensifies precisely as it collects more of it ([Rahmawati & Wardana, 2025](#)).

Given these conditions, this study asks four questions. It asks how the digital technology revolution produced the concepts of e-government, digital identity, and smart city in public service. It asks how government digitalisation has been implemented in Lampung Province during the era of Industry 4.0 and Society 5.0. It asks how that implementation should be evaluated. And it asks what recommendations follow for community participation in the administration of local government.

The policy objectives that frame these questions are equally concrete. The province seeks to improve the quality of public services through digital technology, to make the administration of local government more transparent and effective by the same means, to increase community involvement in internet-based local governance, and to optimise the implementation of e-government, digital identity, and smart city initiatives. Success is understood in terms of a growing number of residents using digital public services, a rising level of participation in voicing aspirations and monitoring public services digitally, better transparency and service quality across the province, and increased access to and use of information technology in local governance.

The contribution of this study lies in bringing a structured policy analysis to a provincial setting that is rarely examined in the digital government literature, which has concentrated on Jakarta, Bandung, Yogyakarta, and the new capital. By assessing four policy alternatives against explicit criteria and reporting the comparison in full, the study gives regional administrators something more useful than a general endorsement of digitalisation: a defensible ranking, with the trade-offs made visible.

2. Literature Review and Hypothesis/es Development

2.1 From Industry 4.0 to Society 5.0 in the Public Sector

The literature on digital government has passed through several phases, and the vocabulary has shifted with each one. Early work treated computerisation as a matter of efficiency. Later work treated it as institutional transformation. The current phase treats it as a question of public value, asking not

whether a service is faster but whether it produces outcomes that citizens recognise as worthwhile. Research on digital innovation strategies in the public sector describes this as a move from isolated projects toward strategic portfolios, in which agencies must decide deliberately what to build, what to buy, and what to leave alone ([Guenduez et al., 2025](#)). The distinction matters for regional governments, which frequently accumulate applications without a strategy and then discover that their systems cannot speak to one another.

Industry 4.0 supplied the technological repertoire for this phase. Society 5.0 supplied a normative correction. Where the former emphasised connectivity and automation, the latter insists that the point of the exercise is social problem-solving. Studies of artificial intelligence and connected devices in government capture both sides, documenting substantial gains in responsiveness while cautioning that the benefits accrue unevenly unless deliberate attention is paid to who can reach the service ([Al-Ansi et al., 2024](#)). Assessment of Indonesian regional readiness for Industry 4.0 reinforces this point from the opposite direction, finding that shortfalls in personnel preparation, user preparation, and leadership commitment matter more than shortfalls in technology ([Sobari et al., 2023](#)).

2.2 E-Government Adoption and Citizen Acceptance

A service that nobody uses has not been delivered. This obvious point has generated a large literature on why citizens adopt or ignore government platforms. Extended technology acceptance models applied in Indonesia find that performance expectancy, effort expectancy, system quality, and perceived transparency drive adoption, while social influence and facilitating conditions play a more moderate role ([Sabani et al., 2023](#)). A large survey of users of the Jakarta Kini application found that government capacity, performance expectancy, and information quality shaped acceptance, and that data security mechanisms deserved explicit attention in system design rather than being treated as an afterthought ([Al-Kautsar Maktub et al., 2025](#)). Comparative evidence from Vietnam adds social media engagement to the list of factors that convert awareness into use, suggesting that the communication channel around a service matters nearly as much as the service itself ([Nguyen et al., 2024](#)).

Adoption studies also caution against assuming that innovative features drive uptake. Work on citizens' intentions to adopt innovative government services shows that perceived benefit is filtered through prior experience, so residents who have been disappointed by one platform approach the next with scepticism ([Adeel et al., 2023](#)). Organisational factors matter as well. A survey of local government employees in Yogyakarta found that structure and culture inside the agency shaped implementation quality, which means that a province can invest in software and still fail if its working culture treats digital services as an additional burden rather than a replacement for existing work ([Pribadi, 2024](#)).

2.3 Digital Identity and Population Administration

Digital identity occupies a peculiar position in this literature because it is simultaneously the most widely used government digital service and one of the least discussed in participatory terms. Studies of e-KTP issuance describe measurable improvements in service delivery once administrative processes were rebuilt around electronic records ([Farida & Ambarwati, 2023](#)). Analysis of digital population identity implementation highlights the security dimension, arguing that citizen confidence depends on visible safeguards rather than assurances ([Permadi & Rokhman, 2023](#)). Implementation research from district registration offices documents the practical obstacles, including limited officer capacity and residents who abandon activation partway through when the process becomes confusing ([Salopah et al., 2024](#)). Evaluation of e-government within the directorate responsible for population and civil registration further shows that service quality varies with how the front office is organised, not merely with the sophistication of the back-end system ([Setyaningrum et al., 2023](#)).

2.4 Smart City and Smart Governance

Smart city research in Indonesia has matured from enthusiasm toward evaluation. Strategic analysis of the concept argues that its value lies in standardising service procedures before digitising them ([Viola](#)

[Fitrianto, 2022](#)). Implementation studies from Bandung document the interoperability problems that emerge when applications are commissioned separately ([Sofyan, 2024](#)). Work on smart city planning for the new capital shows how ambitious designs encounter conventional bureaucratic logic, with regulatory overlap slowing cross-sector decisions ([Rifaid, Abdurrahman, et al., 2023](#)). More recent comparative analysis of smart governance applications across Indonesian provinces concludes that effectiveness depends on whether local governments understand their own socio-spatial context and the rural-urban digital divide, not merely on technological readiness ([Putri et al., 2026](#)). Website quality studies add a further practical finding, showing that the design and interactivity of government portals materially affect whether residents complete the transactions they came for ([Rokhman et al., 2024](#)).

2.5 E-Participation, Transparency, and Accountability

The most directly relevant strand of literature concerns electronic participation. A systematic review of e-participation within e-government initiatives maps a field that has grown quickly but unevenly, with most implementations concentrated at the lower rungs of information provision and consultation ([Adnan et al., 2022](#)). Work on the relationship between e-government and e-participation finds that trust operates as the crucial link, since residents who do not trust the platform will not use it to raise concerns even when the function exists ([Abdulkareem et al., 2022](#)). Synthesis of the public value generated by e-participation initiatives similarly reports that value accrues where participation is embedded in decision processes rather than bolted onto them ([Karkin & Cezar, 2024](#)).

Cross-national evidence on whether e-participation improves voice and accountability finds effects that vary considerably by country context, which is itself an argument for locally grounded analysis rather than imported templates ([Mao et al., 2024](#)). Municipal-level research on e-government mechanisms confirms that specific design choices, rather than general digitalisation, determine whether citizens and civil society actually take part ([Tejedo-Romero et al., 2022](#)). Systematic analysis of digital participation tools distinguishes between platforms that support deliberation and those that merely collect complaints, a distinction that regional governments often blur ([Baeck et al., 2024](#)). Evidence from Indonesia links social media use, good governance, and public trust to citizens' e-government participation, suggesting that the informal digital public sphere feeds the formal one ([Hutahaean et al., 2023](#)). Newer applications, including conversational interfaces built on open government data, point toward participation channels that are always available rather than open during office hours ([Cortés-Cediel et al., 2023](#)).

2.6 Digital Literacy and the Digital Divide

Every participatory ambition runs into the question of who can actually take part. Content analysis of Indonesian media coverage documents persistently low digital literacy, weakest precisely in the security domain ([Afrina et al., 2024](#)). Research on digital literacy as a democratic challenge connects this weakness to vulnerability to misinformation and to a diminished capacity for informed public discussion ([Bulya & Izzati, 2024](#)). Study of digital citizenship in Indonesia argues that literacy programmes must move beyond device operation toward critical and civic competencies if digital governance is to function as intended ([Isabella et al., 2024](#)). These findings carry an uncomfortable implication for regional governments: expanding digital services without expanding digital capability transfers the burden of adaptation onto the residents least equipped to bear it.

H₁: Strengthening community digital literacy produces a high impact on community participation in local governance at moderate cost and moderate ease of implementation.

2.7 Information Technology Infrastructure and Community Participation

Information technology infrastructure provides the foundation for digital governance implementation. Reliable internet connectivity, technological facilities, and digital networks determine whether citizens can access government platforms and participate through digital channels ([Mao, Zhang, Zou, & Deng, 2024](#)). However, infrastructure availability alone does not automatically create meaningful

participation. Citizens with internet access may remain inactive if they lack awareness, trust, or motivation to engage with government platforms. Moreover, infrastructure development requires substantial financial investment, long-term planning, and continuous maintenance, particularly in geographically diverse regions. Therefore, infrastructure should be considered an enabling condition that supports participation rather than a single determinant of citizen engagement.

H₂: Developing information technology infrastructure produces high effectiveness at high cost, with a moderate rather than high impact on community participation.

2.8 E-Government Optimization, Smart City Implementation, and Community Participation

The optimization of e-government and smart city initiatives provides opportunities to strengthen transparency, accountability, and citizen engagement. Integrated digital systems can improve information accessibility, simplify public services, and create more responsive government institutions. Evidence from Indonesian local government studies demonstrates that digital transformation is most effective when it addresses specific service problems rather than merely adopting technology as a symbolic innovation ([Farhan, 2023](#)). Similarly, online public service implementation shows that technology-driven reforms can restructure service delivery when supported by institutional readiness and appropriate governance models ([Sulila, Santoso, Polin, Lukum, & Gobel, 2024](#)). Although these initiatives offer significant benefits, their implementation requires considerable financial resources, specialized expertise, and organizational commitment.

H₃: Optimising e-government and smart city implementation produces high effectiveness and a high impact on community participation, but at high cost and moderate ease of implementation.

2.9 Digital-Based Participation Channels and Community Participation

Digital-based participation channels, including online complaint systems, aspiration forums, and official government social media platforms, provide direct mechanisms for citizens to communicate with government institutions. These channels can improve accessibility and responsiveness by reducing administrative and geographical barriers. Studies of provincial digital applications show that participation platforms can be developed relatively quickly by utilizing existing technological infrastructure ([Ramadhania, Muradi, & Sutisna, 2023](#)). Furthermore, citizen perceptions of responsiveness and service quality influence whether digital platforms are considered effective participation mechanisms ([Prasetia, Wijaya, Yudartha, & Savitri, 2024](#)). Nevertheless, the effectiveness of these channels remains limited by digital exclusion because only citizens with sufficient access and digital competence can participate actively.

H₄: Strengthening digitally based community participation produces a high impact on community participation and high ease of implementation at low cost, but only moderate overall effectiveness.

3. Research Methodology

3.1 Research Design

This study uses a qualitative policy analysis design. The choice follows from the nature of the question. The province is not being asked whether digitalisation works in general, a question already answered many times over, but which combination of available policy instruments will most effectively raise community participation given local constraints on budget, personnel, and infrastructure. That is a comparative judgement about alternatives, and the appropriate method is structured policy assessment rather than hypothesis testing on primary survey data.

The analysis proceeds through the standard sequence of applied policy analysis. Problems were identified from documentary evidence about conditions in Lampung Province. Policy objectives and success criteria were formulated from those problems. Alternatives were generated to address the

objectives. Each alternative was then assessed against explicit criteria, compared with the others, and the comparison was used to derive a recommendation. Because the hypotheses developed in the previous section make claims about relative performance rather than about statistical association, they are evaluated against the assessment results rather than against significance tests.

3.2 Research Setting

The setting is the administration of local government in Lampung Province during the era of Industry 4.0 and Society 5.0. The province was selected for three reasons. It has an active digitalisation programme covering SPBE implementation, online administrative services, official government social media, and digital public service platforms, which means there is something substantive to analyse. It exhibits the full range of constraints that the literature identifies as barriers, including limited infrastructure, uneven digital literacy, a pronounced gap in internet access between urban and rural districts, and unresolved questions about data security. And it belongs to a category of Indonesian provinces that the research literature has largely overlooked in favour of metropolitan cases, so findings here carry information that studies of Jakarta cannot supply.

3.3 Data Sources and Collection

Data were collected through documentary study. Three categories of source were used. Regulatory and institutional documents established the formal framework within which the provincial government operates, including the national SPBE architecture and the sectoral rules governing population administration and public service delivery. Descriptive material on provincial digitalisation initiatives established what has actually been implemented. Peer-reviewed journal articles published within the last five years established the empirical basis for judging what each policy alternative can reasonably be expected to achieve.

The literature component was deliberate rather than incidental. Forty journal articles, drawn from national and international outlets and all carrying active digital object identifiers, were read and used as evidence in the assessment. Where an alternative is scored high on effectiveness, that score rests on published findings about comparable interventions rather than on the analyst's impression. Studies of digital literacy, e-government adoption, digital identity implementation, smart city governance, e-participation, and data protection each informed a specific dimension of the assessment.

3.4 Assessment Criteria

Four criteria structure the comparison. Effectiveness refers to the degree to which an alternative advances the stated policy objectives of service quality, transparency, and participation. Cost refers to the financial and institutional resources required for implementation, including recurring costs of maintenance and training rather than only initial outlay. Ease of implementation refers to the administrative feasibility of the alternative given existing capacity, covering the availability of skilled personnel, the complexity of coordination required, and the time to visible results. Impact on community participation refers specifically to the extent to which the alternative increases residents' involvement in planning, implementation, and oversight of local government affairs.

Each alternative received a rating of high, medium, or low on each criterion. The ratings are ordinal judgements grounded in the reviewed evidence and in the documented conditions of the province. A rating of high on cost indicates that the alternative is expensive, not that it is desirable, and this reading is preserved consistently throughout the comparison.

3.5 Analysis Technique and Trustworthiness

Analysis followed a three-stage procedure of data reduction, presentation, and conclusion drawing. Documentary material was first reduced to statements relevant to the four criteria. Those statements were then arrayed by alternative and by criterion so that patterns and tensions became visible. Conclusions were drawn by comparing the resulting profiles and identifying which combination of alternatives covered the widest range of objectives without exceeding plausible resource limits.

Trustworthiness was addressed through source triangulation. Claims about the effect of an intervention were accepted only where evidence from more than one study pointed in the same direction, and divergent findings were retained rather than smoothed over. The advantages and disadvantages recorded for each alternative are reported in full, including disadvantages that weaken the case for alternatives ultimately recommended. This is a deliberate choice: a policy analysis that reports only the strengths of its preferred option is advocacy rather than analysis.

3.6 Limitations of the Design

Two limitations follow from these choices. The assessment relies on secondary material, so the ratings reflect informed judgement about likely performance rather than measured citizen behaviour in Lampung. And because the four criteria are weighted equally, the comparison does not accommodate a provincial government that assigns overriding priority to one criterion, for instance a leadership that treats cost as a binding constraint. Both limitations are addressed in the closing section.

4. Results and Discussions

4.1 The Digital Revolution and the Emergence of E-Government, Digital Identity, and Smart City

The first research question concerns how technological change produced the three concepts that now organise digital public service in Indonesia. The answer is that each concept solved a problem created by the one before it.

Electronic government emerged as the direct administrative response to the diffusion of the internet. Its initial promise was straightforward. Residents could obtain services without physically attending a government office, and the resulting reduction in face-to-face discretion carried an anti-corruption logic alongside the efficiency logic. Studies of adoption in Indonesia confirm that these benefits materialise, but only when the platform is perceived as useful, usable, and transparent, which places the burden of success on design rather than on availability ([Sabani et al., 2023](#)). Evidence from large-scale provincial applications shows the same pattern, with government capacity and information quality emerging as decisive ([Al-Kautsar Maktub et al., 2025](#)).

Electronic identity arose because e-government created a verification problem. A service delivered remotely must be able to establish who is requesting it. The nationally integrated population identity number solved that problem and simultaneously became the connective tissue for health services, education, social assistance, and financial inclusion. Implementation research documents genuine improvements in issuance and record accuracy once workflows were rebuilt around the electronic record ([Farida & Ambarwati, 2023](#)), while the migration toward device-based digital identity has shifted attention to the protection of the credential itself ([Permadi & Rokhman, 2023](#)). The smart city concept arose because e-government and digital identity, taken separately, produced a proliferation of disconnected systems. Its contribution is integrative: it treats digital service, environmental management, mobility, and civic participation as parts of a single development approach rather than as separate projects. Strategic analysis of Indonesian practice emphasises that the value lies in standardising and simplifying procedures before automating them ([Viola & Fitrianto, 2022](#)), and implementation studies confirm that the invisible work of interoperability determines whether the visible applications function ([Sofyan, 2024](#)). Comparative analysis across provinces adds that local socio-spatial understanding, including awareness of the rural-urban divide, distinguishes effective smart governance from expensive smart governance ([Putri et al., 2026](#)). Society 5.0 sits above all three as a normative frame. Its insistence that technology serve human welfare rather than industrial output means that a province cannot claim success on the basis of transaction volumes alone. The measure is whether residents, including those with limited skills and limited connectivity, are better served and more involved than before.

4.2 Implementation of Government Digitalisation in Lampung Province

The second research question concerns implementation in the province. Lampung has adopted the national architecture and built on it. SPBE implementation provides the governing framework. Online administrative services have moved a portion of routine transactions off the counter. Official social media accounts function as a communication channel with residents. Digital public service platforms have been developed with the stated aims of increasing transparency, accelerating administrative service, and widening access to local government services. The problems that accompany this progress are specific rather than general. Information technology infrastructure is limited, which constrains service availability in parts of the province. Digital literacy among residents is low, which constrains use even where services are available. Internet access differs between urban and rural areas, which means that the same provincial service produces different experiences depending on where a resident lives. Digital data security poses risks that residents perceive even when they cannot articulate them technically. And community participation in digital governance is not yet optimal, because a portion of the population cannot make full use of digital technology.

These conditions are consistent with national findings. Assessment of regional readiness for Industry 4.0 identified weaknesses in personnel readiness, user readiness, socialisation, and infrastructure across Indonesian regional governments, and Lampung profile matches that pattern closely ([Sobari et al., 2023](#)). Analysis of SPBE contribution to accessibility shows that the framework extends reach but cannot compensate for absent connectivity ([Choirunnisa et al., 2023](#)). Work on harmonising SPBE across levels of government points to the coordination problem that provinces face when national systems and local systems evolve separately ([Hadi & Widnyani, 2024](#)). Research on digital citizenship establishes that the literacy gap is national rather than peculiar to Lampung, which means the province is contending with a structural condition rather than a local failure ([Isabella et al., 2024](#)).

4.3 Assessment of Policy Alternatives

The third research question asks how the implementation of digital public service should be evaluated. Four alternatives were assessed.

4.3.1 Strengthening Community Digital Literacy

The first alternative is to raise community digital literacy through education, socialisation, and training in the use of digital public services. Digital literacy is essential if residents are to use information technology effectively to access services and to take part in local governance. The capacity of the community to use digital technology is a decisive component in the success of e-government implementation, a conclusion supported across the adoption literature ([Sabani et al., 2023](#); [Isabella et al., 2024](#)).

The forecast outcomes of this alternative are that the use of government digital services becomes clearer to the community, that the number of people participating in digital governance increases, and that digital public services become more optimally used. The assessment identified four advantages. The alternative increases community knowledge of digital technology. It encourages public participation in digital public services. It makes community access to government services easier. And it prevents errors in the use of digital services, which reduces the burden on help desks and field officers. Four disadvantages were also recorded. Implementation requires a considerable period of time. Costs are incurred for education and socialisation activities. Levels of understanding differ across the community, so a single programme design will not serve everyone. And adaptation to digital technology remains difficult for a portion of the population regardless of training quality.

4.3.2 Developing Information Technology Infrastructure

The second alternative is to improve information technology infrastructure and internet networks, especially in rural areas and districts that still have limited digital access. Digitalisation of local government and electronic public service delivery requires adequate technological infrastructure, without which every other initiative operates at reduced capacity. The forecast outcomes are that

community access to digital services becomes more evenly distributed, that the use of digital public services becomes more efficient, and that differences in internet access between urban and rural areas may be reduced.

The advantages recorded are that the alternative expands community access to the internet and to digital services, that it enables smooth technology-based public services, that it reduces the digital gap between city and countryside, and that it improves the performance of internet-based government systems. The disadvantages are that development costs are required, that infrastructure construction takes a considerable period of time, that geographic conditions are not always suitable in every area, and that technology needs to be maintained on a continuing basis rather than treated as a one-time investment.

4.3.3 Optimising E-Government and Smart City Implementation

The third alternative is to optimise the application of e-government and the smart city concept in local government. To improve governmental transparency and the quality of public service, the local government can develop digital public service applications, online administrative systems, and integrated digital communication media. Evidence from implementation studies indicates that the integration dimension carries most of the weight ([Sofyan, 2024](#)), and that portal design and interactivity determine whether residents complete their transactions ([Rokhman et al., 2024](#)). Comparable evidence from restructured service lines shows what a model-driven approach can achieve when applied to a specific service rather than to government in general ([Sulila et al., 2024](#)).

The forecast outcomes are that public services become more effective and faster, that the transparency of local government increases, and that communication between the community and the government improves. The advantages recorded are that public services become more efficient and faster, that governmental transparency increases, that communication between the community and the government is facilitated, and that the alternative supports the broader modernisation of local government. The disadvantages are that the alternative requires human resources with technological expertise, that system disruption and cyberattacks are very possible, that the development of digital systems requires expenditure, and that the resulting services depend heavily on technology and internet networks.

4.3.4 Strengthening Digitally Based Community Participation

The fourth alternative is to increase community participation through digital media, including online discussion forums, online complaint applications, and local government social media. Digital community participation can increase involvement in regional policy-making and in the oversight of public services. The e-participation literature supports this expectation while cautioning that the depth of participation depends on whether the channel is embedded in decision processes ([Adnan et al., 2022](#); [Karkin & Cezar, 2024](#)), and that trust in the platform governs whether residents use it at all ([Abdulkareem et al., 2022](#)).

The forecast outcomes are that it becomes more common for the community to convey aspirations and complaints, that public services become more closely monitored, and that the relationship between government and community becomes more visible and more engaged. The advantages recorded are that the alternative strengthens community participation in local governance, that it facilitates the communication of aspirations and complaints, that it increases the accountability of public services, and that it helps government learn directly about community needs. The disadvantages are that community members who are not digitally active will not use digital media, that there is a substantial possibility of false information spreading through online media, that monitoring the use of digital media is essential and itself resource-consuming, and that access to technology remains limited for part of the community.

4.4 Comparison of Alternatives

Table 1. Comparison of Policy Alternatives

Policy Alternative	Effectiveness	Cost	Ease of Implementation	Impact on Community Participation
Strengthening Community Digital Literacy	High	Medium	Medium	High
Developing Information Technology Infrastructure	High	High	Medium	Medium
Optimising E-Government and Smart City	High	High	Medium	High
Strengthening Digitally Based Community Participation	Medium	Low	High	High

Table 1 shows that three alternatives achieve high effectiveness, but they differ in what they cost and in how directly they reach the participation objective. Infrastructure development is effective and necessary yet produces only a moderate participation impact, because connectivity enables engagement without causing it. Digital literacy and smart city optimisation both deliver high participation impact, the former at moderate cost and the latter at high cost. Digitally based participation is the outlier, it is the cheapest and easiest alternative and still returns a high participation impact, but its overall effectiveness is only moderate because it operates within the limits set by the other three. On the basis of this comparison, the combination of community digital literacy strengthening, e-government and smart city optimisation, and digitally based community participation constitutes the most effective set of policy alternatives. These three options are judged capable of improving the quality of public service, increasing the transparency of local government, and increasing community involvement in digitally based governance during the era of Industry 4.0 and Society 5.0.

4.5 Evaluation of the Hypotheses

Table 2. Hypothesis Evaluation

Hypothesis	Claim	Assessment Result	Status
H_1	Digital literacy: high participation impact, medium cost, medium ease	High effectiveness, medium cost, medium ease, high participation impact	Supported
H_2	Infrastructure: high effectiveness, high cost, moderate participation impact	High effectiveness, high cost, medium ease, medium participation impact	Supported
H_3	E-government and smart city: high effectiveness and participation impact, high cost, medium ease	High effectiveness, high cost, medium ease, high participation impact	Supported
H_4	Digital participation: high participation impact, high ease, low cost, moderate effectiveness	Medium effectiveness, low cost, high ease, high participation impact	Supported

Based on Table 2, all four hypotheses are supported by the assessment. This convergence should be read carefully. It does not demonstrate that the underlying literature is correct; it demonstrates that the assessment of Lampung alternatives is consistent with what that literature would predict, which strengthens confidence in the comparison without proving causation. The more interesting result is what the pattern implies for sequencing, since H_2 and H_4 together suggest that the province can begin with a low-cost, high-participation intervention while the expensive and slow infrastructure work proceeds in parallel.

4.6 Recommended Alternatives and Strategic Steps

The fourth research question asks what recommendations follow. Based on the assessment and comparison, strengthening community digital literacy, optimising e-government and smart city implementation, and increasing digitally based community participation are the most advisable alternatives. This combination is judged the most effective because it simultaneously improves the quality of public service, increases community access to digital services, and improves both transparency and community participation in the administration of local government.

During the era of Industry 4.0 and Society 5.0, local government must be able to build public services that are innovative, fast, transparent, and focused on community needs. Improving digital literacy together with developing an electronic-based government system is therefore an essential step toward better public service quality and greater community involvement in digital governance. Digital community participation further strengthens government-community communication and improves public oversight of local government services, a relationship documented in studies linking social media use, good governance, and trust to citizen participation ([Hutahaean et al., 2023](#)).

Four strategic steps follow.

1. Improving community digital literacy. The provincial government of Lampung should strengthen educational programmes on the use of digital public services. Activities of this kind can be delivered through community organisations, social media, and schools so that residents are able to use digital technology wisely when accessing public services. The design should account for differing levels of prior knowledge, since uniform programmes reproduce the gap they are meant to close ([Afrina et al., 2024](#); [Bulya & Izzati, 2024](#)).
2. Developing information technology infrastructure. The local government should improve internet networks and information technology facilities, particularly in more rural areas that still have limited internet access. Adequate technological infrastructure will make the equitable distribution of digital public services possible and will reduce the gap between communities in access to technology. Maintenance obligations should be budgeted from the outset rather than treated as an afterthought ([Putri et al., 2026](#)).
3. Optimising e-government and smart city implementation. The provincial government should develop public service applications that are integrated, easy to use, and transparent. The smart city concept should be focused on improving public services, openness of information, and bureaucratic efficiency so that the community can obtain services more quickly and more efficiently. Attention to authentication, authorisation, and data protection mechanisms belongs in the design phase, given the security concerns documented across the digital identity and data governance literature ([Wibowo, 2024](#); [Rahmawati & Wardana, 2025](#); [Schmeling et al., 2025](#)).

4. Strengthening digitally based community participation. The local government should use digital communication platforms such as community aspiration forums, online complaint applications, and local government social media to improve communication with residents. Digital media allow the community to convey aspirations, criticism, and oversight of public services more actively, which produces a government that is more engaged and more accountable. Responsiveness matters more than availability here, since residents form judgements about whether their input produces any result and adjust their behaviour accordingly ([Prasetia et al., 2024](#); [Ramadhania et al., 2023](#)). With these strategic steps in place, community participation in the administration of local government during the era of Industry 4.0 and Society 5.0 is expected to increase, and the community will be positioned to support the development of public services that are effective, transparent, and based on digital technology.

4.7 Discussion

Three implications deserve emphasis.

The first concerns sequencing. Policy discussion in Indonesian provinces often treats infrastructure as the natural first step, on the reasonable grounds that nothing works without connectivity. The assessment here complicates that intuition. Infrastructure is expensive and slow, and its participation impact is only moderate. Meanwhile, digitally based participation is cheap, quick to establish, and delivers a high participation impact within its coverage area. A province that waits for infrastructure completion before opening participation channels forfeits years of engagement with residents who already have connectivity. The stronger course is to run both simultaneously, accepting that participation will initially be uneven, while literacy programmes and network expansion gradually widen the base. This reading is consistent with evidence that e-participation effects vary by national and local context rather than following a fixed developmental sequence ([Mao et al., 2024](#)).

The second concerns the difference between transactional and participatory digitalisation. Most of what Lampung has built so far, in common with most Indonesian regional governments, serves transactions. Residents obtain documents, check statuses, and submit applications. Participation in the fuller sense, meaning involvement in planning and oversight, requires different design choices, since a complaint form is not a deliberation platform. The e-participation literature is explicit that channels supporting deliberation differ structurally from channels collecting individual grievances ([Baeck et al., 2024](#)), and that public value is generated where participation is embedded in decision processes ([Karkin & Cezar, 2024](#)). Provinces that treat a complaint application as the fulfilment of their participation obligation will record activity without achieving involvement.

The third concerns trust as the binding constraint. Every alternative assessed here depends on residents believing that the platform will work, will protect their information, and will produce a response. Trust is not a separate policy instrument that can be procured; it accumulates through consistent experience, and it erodes quickly when a data breach occurs or when submitted aspirations disappear without acknowledgement. Research linking trust to e-participation makes the dependency explicit ([Abdulkareem et al., 2022](#)), and work on organisational culture inside government agencies shows that internal attitudes toward digital services translate into the responsiveness that residents experience ([Pribadi, 2024](#)). Emerging service channels built on open data and conversational interfaces may reduce response times further ([Cortés-Cediel et al., 2023](#)), and international comparison suggests that specific mechanism design, rather than digitalisation in the abstract, determines participation outcomes ([Tejedo-Romero et al., 2022](#); [Nguyen et al., 2024](#)). Portfolio-level strategic choices about what to build and what to leave alone shape whether any of this coheres ([Guenduez et al., 2025](#)), and public service innovations succeed most reliably when aimed at a concrete service failure ([Farhan, 2023](#)). Front-office organisation and the practical competence of registration staff remain decisive at the point of contact ([Setyaningrum et al., 2023](#); [Salopah et al., 2024](#)), as does citizen willingness to adopt services perceived as genuinely beneficial ([Adeel et al., 2023](#)). Longitudinal evidence on Indonesian e-participation and on the democratising effect of

digitalisation situates all of this within a slow but real widening of who takes part in local decisions ([Wijaya et al., 2022](#); [Harahap & Harahap, 2023](#)), while connected technologies continue to raise the ceiling of what responsive service can mean ([Al-Ansi et al., 2024](#)). Public trust in government policy, finally, conditions the reception of every initiative described here ([Rifaid, Rachman, et al., 2023](#)), including the ambitious smart city designs that have attracted the most attention ([Rifaid, Abdurrahman, et al., 2023](#)).

5. Conclusions

This study set out to determine how community participation in the administration of local government in Lampung Province can be strengthened as digital technologies associated with Industry 4.0 and Society 5.0 reshape public service delivery. Four policy alternatives were assessed against effectiveness, cost, ease of implementation, and impact on community participation.

The assessment produced a clear result. Strengthening community digital literacy, developing information technology infrastructure, and optimising e-government and smart city implementation each achieve high effectiveness, but they differ in expense and in how directly they touch participation. Infrastructure development returns a moderate participation impact despite its high cost, because connectivity enables engagement without producing it. Digitally based participation is the least expensive and the easiest to implement while still delivering a high participation impact, though its overall effectiveness is bounded by the limits of the other alternatives. The combination of digital literacy strengthening, e-government and smart city optimisation, and digitally based participation therefore represents the most effective policy mix available to the province.

Four strategic steps translate this conclusion into action: improving community digital literacy through community organisations, social media, and schools; developing information technology facilities and internet networks in rural districts with limited access; developing integrated, usable, and transparent public service applications under a smart city framework focused on service quality, information openness, and bureaucratic efficiency; and strengthening digital communication platforms through aspiration forums, online complaint applications, and official social media.

Two limitations qualify these findings. The assessment rests on documentary evidence and normative judgement rather than on primary data about citizen behaviour in Lampung, so the ratings indicate expected rather than measured performance. And the four criteria carry equal weight, which does not accommodate a provincial administration operating under a binding budget constraint that would elevate cost above the other considerations.

Both limitations point toward the same research agenda. A survey of Lampung residents measuring actual use of provincial digital services, disaggregated by district and by literacy level, would convert the participation impact ratings from expectations into measurements. Comparative work across several Indonesian provinces with similar infrastructure profiles would establish whether the sequencing implication identified here generalises. And longitudinal study of a specific participation channel, tracking whether submitted aspirations produce visible administrative responses, would address the question that ultimately determines whether digital participation becomes a habit or a disappointment.

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Author Contributions

TA contributed to all stages of this research, including conceptualization, development of the research framework, literature review, data collection, policy analysis, interpretation of findings, and preparation and revision of the manuscript. The author has read and approved the final version of the manuscript.

Conflict of Interest

The author declares that there is no conflict of interest regarding the publication of this article. This research was conducted independently and objectively, and the author is fully responsible for the content, analysis, and conclusions presented in the manuscript.

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