



A Participatory and Performance-Based Evaluation Model for Adaptive Local Governance

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ABSTRACT

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This study presents a novel model for local governance—Evaluative, Participatory, Adaptive Model Based on Performance and Data (EPABKD)—designed to enhance planning coherence, stakeholder engagement, and responsiveness in decentralized systems. The model reconfigures the traditional CIPP evaluation framework by embedding participatory evaluation, real-time feedback, and performance-based alignment into a unified, adaptable system. Developed and tested within a subnational governance context, EPABKD addresses common planning challenges such as symbolic participation, fragmented data use, and plan–budget mismatches. It institutionalizes stakeholder roles through independent evaluation boards and applies tools like the Program Alignment Index (PAI) to ensure coherence between strategic documents and implementation. Unlike existing models such as CIPP, CIPPO, Logic Models, or the Kirkpatrick framework, D-SMART integrates digital tools, stakeholder governance, and SDG-linked performance tracking in a unified and adaptive architecture. Its successful application demonstrates potential for broader use in localizing Sustainable Development Goals (SDGs) and improving public accountability. The study contributes to evaluation and planning literature by advancing a participatory, performance-based alternative to static, technocratic approaches in sustainable development governance.

1. INTRODUCTION

Regional development planning in decentralized systems increasingly demands not only institutional autonomy but also strategic coherence, data integration, and citizen participation [1, 2]. In Indonesia, local governments are legally empowered to design their own development strategies (RPJMD), annual programs (RKPD), and budgets (APBD). However, persistent misalignments among these instruments and weak participatory mechanisms hinder the realization of Sustainable Development Goals (SDGs) [3-5].

Among existing evaluation tools, the CIPP (Context, Input, Process, Product) model is widely used for its structured and formative evaluation framework [6, 7]. Introduced by Stufflebeam in the 1970s, it evaluates not only outcomes but also the contextual and procedural factors shaping program success [8-10]. However, critics argue that in dynamic policy environments—particularly decentralized governance—the CIPP model often lacks integration with digital platforms, real-time feedback systems, and participatory processes [11-13]. Its linear and static structure limits applicability in fragmented planning environments, where coordination, responsiveness, and inclusivity are essential [14, 15].

In addition to CIPP, several other evaluation frameworks—such as the CIPPO model, the Kirkpatrick model, and Logic Models—have been widely applied across education, training,

and development sectors. CIPPO extends CIPP by adding an “Outcomes” component but remains limited in addressing participatory governance and digital adaptability. The Kirkpatrick model evaluates impact through four levels (reaction, learning, behavior, and results), yet it lacks policy integration and stakeholder feedback mechanisms essential in public sector planning. Logic Models, though visually intuitive, typically follow linear logic and offer limited flexibility for real-time corrections or feedback loops in multi-stakeholder environments. These limitations reveal a gap in models capable of integrating adaptive feedback, data-driven planning, and multi-stakeholder participation in decentralized governance contexts [16-18].

These limitations are evident in regional contexts such as Dairi Regency, where program fragmentation, underutilization of digital tools like SIPD, and procedural citizen engagement continue to challenge effective planning and evaluation [16-18]. Recent studies suggest that modern governance requires evaluation frameworks that are not only evidence-based but also adaptable and participatory—able to integrate stakeholder feedback and support plan–budget coherence throughout the policy cycle [19-21].

As digital platforms proliferate, systems like Indonesia’s SIPD provide real-time tracking of financial and development indicators. These tools have proven effective in increasing transparency and coordination when supported by institutional

capacity and participatory governance [22, 23]. Simultaneously, participatory planning mechanisms—such as citizen scorecards, community forums, and multi-actor coalitions—have gained traction for enhancing legitimacy, responsiveness, and policy relevance [6, 24]. Yet, few evaluation models successfully merge digital systems and participatory structures into a cohesive planning framework [25, 26].

To address this gap, this study introduces the EPABKD framework (Evaluative, Participatory, Adaptive Model Based on Performance and Data), which restructures the foundational logic of CIPP by embedding five dynamic components. In its operationalized form within Dairi Regency, EPABKD takes shape as the D-SMART model (Dairi – Sustainable Monitoring, Alignment, and Result-Based Transformation)—a planning-evaluation hybrid designed for scalability in decentralized, digitally diverse, and SDG-oriented governance environments [27-29].

To guide this inquiry, the study is structured around the following research questions:

- i. What are the institutional, participatory, and technological challenges that limit the effectiveness of regional development planning in decentralized settings such as Dairi Regency?
- ii. How can the classical CIPP evaluation framework be expanded to integrate participatory governance, digital monitoring, and SDG-oriented planning?
- iii. What are the practical impacts and theoretical contributions of the D-SMART model in enhancing planning coherence, performance accountability, and citizen participation at the local level?

2. METHODOLOGY

2.1 Research design and iterative model development

This study adopts a design-based qualitative research (DBQR) approach to conceptualize, construct, and validate the D-SMART model as a modernized extension of the classical CIPP evaluation framework. DBQR is uniquely suited to dynamic policy environments because it allows for iterative model development, empirical testing, and contextual adaptation through stakeholder feedback and field validation [30].

To structure this intervention, the authors developed the EPABKD (Evaluative, Participatory, Adaptive Based on Performance and Data) framework—a meta-evaluation model informed by adaptive governance, stakeholder theory, and performance-based planning principles.

EPABKD is designed as a generalizable architecture for decentralized evaluation and planning systems. Within this study, EPABKD is contextualized and tested in Dairi Regency through the construction of the D-SMART model (Dairi – Sustainable Monitoring, Alignment, and Result-Based Transformation), which serves as its operational embodiment. D-SMART functions as a real-world prototype of EPABKD, adapted to Dairi's planning instruments, institutional dynamics, and digital infrastructure (Figure 1).

These phases ensured that the model was not only grounded in governance theory and SDG frameworks but also reflected the empirical realities of subnational planning in decentralized systems.

2.1.1 Iterative model development in the DBQR process

In line with the principles of design-based qualitative research (DBQR), the development of the D-SMART model followed a structured and cyclical process of refinement. This included three core phases:

- Phase 1: Conceptual Design and Prototype Formation:

Drawing from CIPP theory, adaptive governance literature, and participatory evaluation models, the authors constructed the initial EPABKD framework. Consultations with three policy experts and a review of existing evaluation models informed the selection of its five core components.

- Phase 2: Field Testing and Contextual Adaptation: The prototype was applied to the Dairi Regency planning environment. Through document analysis (RPJMD, APBD), interviews (n = 15), and SIPD dashboard observations, critical feedback emerged. These findings shaped component-level refinements—for instance, formalizing stakeholder boards and restructuring quarterly review loops.

- Phase 3: Simulation and Expert Validation: A revised version, D-SMART, was tested using simulated planning cycles for 2022–2023. It was then reviewed by five evaluators (local and national) using a Likert rubric for feasibility, clarity, and scalability. Simulation outputs—including improved RPJMD–APBD alignment and integration of community proposals—guided final revisions.

This iterative process aligns with DBQR principles of design, enactment, analysis, and redesign, ensuring that the resulting model is not only theory-informed but also empirically grounded and locally usable [30, 31].

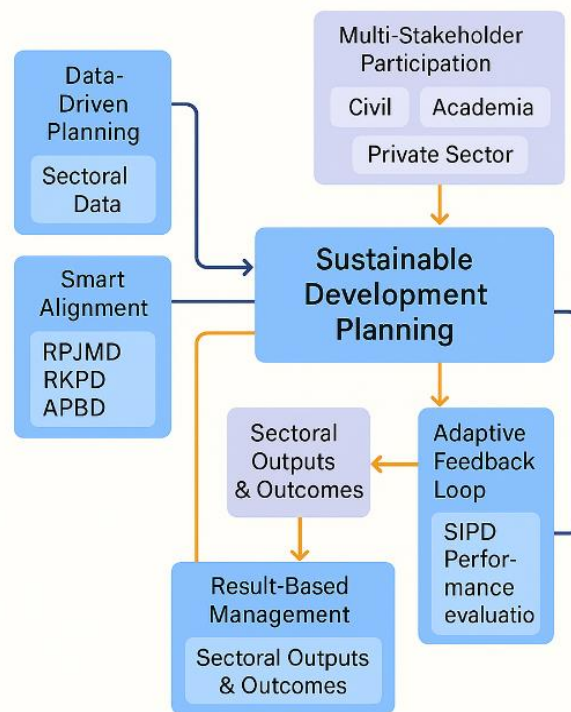


Figure 1. The D-SMART model: A participatory and digital framework for regional sustainable development planning

These components interact cyclically, reinforcing sectoral coherence, participatory legitimacy, and data-informed planning. Together, they transform static evaluation logic into an adaptive and participatory planning architecture.

2.2 Case selection and scope

The study centers an exercise of SMART model on Dairi Regency, a district in North Sumatra, Indonesia, where selected for its representative features of decentralized planning: a complete suite of policy instruments (RPJMD, RKPD, RENSTRA, APBD), mid-level fiscal autonomy, and partial adoption of digital systems (e.g., SIPD). Dairi reflects common subnational governance challenges such as fragmented planning cycles, procedural participation, and low plan–budget alignment—making it an appropriate testbed for model validation.

- The unit of analysis included:
- Strategic planning instruments (RPJMD 2019–2024, RENSTRA OPD)
 - Annual budget documents (APBD 2021–2023)
 - Digital systems (SIPD, SAKIP, e-Monev)
 - Stakeholder perspectives from government, civil society, and academia

2.3 Data collection and sources

2.3.1 Thematic coding and NVIVO application

Thematic analysis was conducted using NVivo 14 to organize and interpret qualitative data gathered from stakeholder interviews and observational sources. The coding strategy followed a hybrid approach, combining deductive themes derived from the research questions (e.g., policy alignment, participation, data integration) with inductive themes that emerged from interview transcripts.

Transcripts were first uploaded into NVivo and segmented into manageable excerpts. Initial coding categories (“nodes”) were developed based on five core dimensions: (1) Planning–Budget Coherence, (2) Stakeholder Participation, (3) Data Utilization, (4) Evaluation Logic, and (5) SDG Orientation.

During the second cycle of coding, these nodes were refined and expanded based on emerging subthemes, such as “symbolic participation,” “digital underutilization,” and “political budgeting.”

- Example Coding Excerpt:
- Theme: *Symbolic Participation*
 - Quote: “Musrenbang feels symbolic. Our ideas never reach the budget level.”—*Civil Society Organization Representative*.
 - Node Assigned: Participation→Procedural Inclusion

Table 1. Overview of data sources and analytical purposes

Data Type	Source	Purpose
Policy Documents	RPJMD, RKPD, APBD, RENSTRA OPD	Mapping alignment, performance indicators, and priorities
Legal Frameworks	Law No. 23/2014, Law No. 25/2004, Perda 3/2024	Establishing planning mandates and institutional roles
Stakeholder Interviews	BAPPEDA, DPRD, CSOs, academics (n = 15)	Identifying institutional gaps, participation, and logic
Observational Data	Musrenbang forums, SIPD dashboard audits	Validating participatory and digital practices in real time

Matrix coding queries were used to cross-tabulate themes by stakeholder group (e.g., BAPPEDA vs. DPRD) to identify differences in perception. Coding reliability was ensured through peer review among the authors, and discrepancies were resolved through memo-based reflections.

To ensure analytical validity and contextual depth, four data streams were triangulated as summarized in Table 1.

All qualitative data were thematically coded using NVivo 14 through a hybrid inductive–deductive approach, detailed in Section 2.3.1, with analysis centered on five dimensions: policy alignment, stakeholder inclusion, data integration, evaluation logic, and SDG orientation [32].

2.4 Analytical framework and component mapping

The D-SMART model consists of five interlinked components that are systematically embedded across the regional planning and budgeting cycle. Each component is mapped to relevant governance instruments, emphasizing digital integration and alignment with SDG targets (see Table 2).

Table 2. D-SMART component integration across planning instruments (linked to program alignment and SDG tracking tools)

Model Component	RPJMD Linkage	RKPD / APBD Function	SIPD / Digital Tool Integration
Data-Driven Planning	Strategic goals, baseline	Indicators and budget targets	Sector dashboards, KUA–PPAS
Smart Alignment	Mission logic	Program priorities (Renja-OPD)	e-Matching, e-Budgeting
Multi-Stakeholder Input	Musrenbang public forums	Proposal feedback, community reps	SIPD access logs, civic suggestions
Adaptive Feedback Loop	Mid-term review clauses	APBD-P adjustments	SIPD quarterly monitoring
Result-Based Management	IKU–IKK indicators	Output-to-performance tracking	SAKIP, e-Monev integration

To assess alignment performance, the Alignment Index (AI) was calculated using the formula:

Alignment Index (AI) = $\frac{\sum P_a}{\sum P_t} \times 100$

- where,
- P_a : Number of programs in the APBD that align with RPJMD targets
 - P_t : Total strategic programs listed in RPJMD

This index quantifies the policy-program coherence before and after D-SMART’s application. The development and use of the Alignment Index (AI), referred to here as the Program Alignment Index (PAI), draws upon alignment and coherence principles found in results-based budgeting and strategic public management frameworks [1, 3, 27]. While not statistical in nature, the index provides a quantitative proxy for coherence between strategic goals (RPJMD) and budget execution (APBD), which is a core challenge in decentralized

governance. It was designed for diagnostic simplicity, ensuring usability in subnational governments where planning complexity and data fragmentation often hinder sophisticated impact evaluation.

The PAI’s validation followed a triangulated strategy:

- Document Analysis: RPJMD and APBD documents from 2021–2023 were cross-checked to count and categorize alignment cases.
- Simulation Testing: The 2022–2023 planning cycles were hypothetically restructured using D-SMART, resulting in a simulated 14% improvement in alignment.
- Stakeholder Review: Local BAPPEDA officials and civil society stakeholders reviewed the index logic and confirmed its policy relevance and ease of interpretation.

While the index does not measure impact, it serves as a practical tool for strategic monitoring, enabling real-time tracking of plan–budget coherence and highlighting misalignments early in the policy cycle.

2.5 Model validation strategy

The model was validated using a multi-method triangulation strategy:

- Comparative Assessment: D-SMART and classical CIPP were compared across six criteria: adaptability, data use, stakeholder inclusion, SDG linkage, coherence, and digital alignment.
- Expert Panels: Five evaluators (3 local, 2 national) scored the model on feasibility, clarity, and scalability using a Likert rubric.
- Simulation Exercises: The 2022–2023 Dairi planning

cycles were restructured theoretically using D-SMART to test scenario responsiveness and feedback flexibility.

- Sensitivity Checks: Outputs were cross-checked against budget execution gaps and mid-year policy adjustments to test model responsiveness.

2.6 Ethical considerations

This study followed institutional ethical protocols. All participants provided informed consent. Sensitive budget and policy data were anonymized, securely stored, and used solely for research purposes, in accordance with national guidelines for public sector research.

3. RESULT AND DISCUSSION

3.1 Data sources and analytical basis

Despite the RPJMD’s stated commitment to digital transformation, inclusive infrastructure, and participatory development, APBD execution revealed structural incoherence. A stark example lies in the mismatch between fiscal targets and actual revenue realization (Figure 2 and Table 3).

This reactive revenue pattern illustrates the absence of a fiscal-policy alignment mechanism, reinforcing the need for Smart Alignment, a core component of the D-SMART model. Moreover, capital expenditures (Belanja Modal) remained marginal relative to operational spending, undermining infrastructure and innovation ambitions.

Table 3. Realization of local revenues against RPJMD targets

Revenue Type	Target (IDR B)	Realization (IDR B)	% Realization	Remarks
Local Own-Source Revenue (PAD)	87.04	112.52	129.3%	Overshot due to retribution spike
Regional Tax	~32.65	21.62	66.2%	Underperformed
Regional Retribution	~4.39	60.63	1,382%	No linkage to RPJMD targets
Other Legal PAD	~38.60	18.31	47.4%	Under-realized

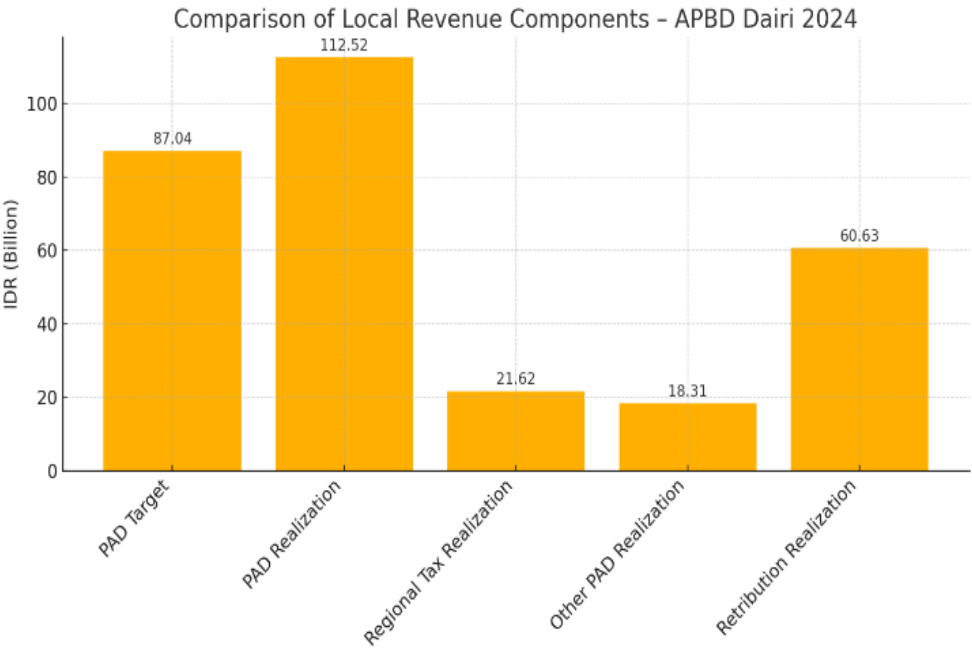


Figure 2. Revenue composition of APBD Dairi 2024 regional retribution far exceeded its target, while core revenue components underperformed

3.2 Deficits in participatory and adaptive planning

Forums such as Musrenbang remained largely procedural, with minimal conversion of community proposals into actionable budget allocations. The TEPD (Regional Evaluation Team) existed informally and lacked legal mandate or resources, while mid-year evaluations remained budget-centric rather than policy-responsive. SIPD tools were underutilized, primarily functioning as a reporting interface rather than a dynamic planning or monitoring platform as shown in Table 4.

Table 4. Governance challenges identified in stakeholder interviews

Theme	Quote	Stakeholder Type
Planning–Budget Incoherence	“Programs are inserted during budgeting without links to RPJMD outcomes.”	BAPPEDA
Weak Participation	“Musrenbang feels symbolic. Our ideas never reach the budget level.”	CSO
SIPD Underutilization	“We submit documents to SIPD but don’t use it for planning or monitoring.”	OPD
Political Budgeting	“Changes in APBD reflect lobbying, not performance.”	DPRD
No Feedback Mechanism	“No tool exists to adjust plans quarterly based on performance.”	Academic

3.3 Component-level validation of the D-SMART model

A. Data-driven planning
Sectoral data remained siloed, non-standardized, and inaccessible for planning. Most departments continued to rely on static formats such as spreadsheets or PDFs, while SIPD dashboards remained significantly underutilized (Figure 3).

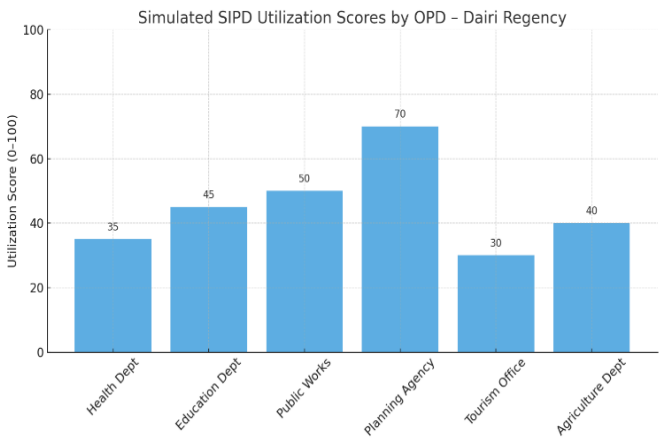


Figure 3. Simulated SIPD utilization by OPD in Dairi Regency planning agency showed moderate usage; most line departments lagged

D-SMART addresses this through integrated sector dashboards and centralized access via SIPD-linked tools.

B. Smart alignment
Using the Program Alignment Index (PAI):

Program Alignment Index (PAI) =

$$\left(\frac{\text{Number of Programs funded in APBD}}{\text{Total Strategic Programs in RPJMD}}\right) \times 100$$

Example: 6 of 10 RPJMD programs were funded in 2024
PAI = 60% (Table 5).

Table 5. Sample alignment between RPJMD and APBD

Program ID	Program Name	RPJMD	APBD
PRG-001	Youth Empowerment	✓	✓
PRG-003	Tourism Revitalization	✓	✗
PRG-007	Public WiFi Access	✓	✗
PRG-010	Climate-Resilient Agriculture	✓	✗

40% of RPJMD strategic priorities lacked budget execution—highlighting urgent need for D-SMART’s alignment dashboard.

C. Multi-stakeholder participation

Participation lacked continuity and authority. D-SMART introduces a Stakeholder Evaluation Board with formal quarterly reporting and input rights.

D. Adaptive feedback loop

No structured process exists for intra-year program revision. D-SMART embeds Triannual Digital Review Cycles via SIPD dashboards, enabling data-based mid-cycle corrections.

E. Result-based management

Current indicators focus on activity counts (e.g., “number of trainings”). D-SMART emphasizes outcome-linked SDG indicators such as reduction in maternal mortality or improvements in youth employment.

3.4 Validation outcomes of the D-SMART model

The D-SMART model underwent multi-method validation as described in Section 2.5, with each method contributing distinct evidence of the model’s utility and robustness.

A. Comparative assessment

In the head-to-head comparison with the classical CIPP model, D-SMART scored higher across all six evaluative dimensions (Table 6):

Table 6. Comparative performance: D-SMART vs. classical CIPP

Criterion	CIPP Avg Score	D-SMART Avg Score
Adaptability	2.7	4.6
Data Use	2.1	4.5
Stakeholder Inclusion	3.0	4.8
SDG Linkage	2.4	4.3
Planning Coherence	2.9	4.7
Digital Compatibility	2.2	4.6

Likert scale: 1 = very weak, 5 = very strong

These results validate D-SMART’s superiority in addressing real-world governance challenges through structured innovation.

B. Expert panel evaluation

Five evaluators (three local policy practitioners, two national planning experts) rated the model's:

- Feasibility: 4.6 / 5
- Clarity: 4.8 / 5
- Scalability: 4.4 / 5

Qualitative feedback highlighted the model's ease of integration into SIPD and its potential for broader use across Indonesian districts.

C. Simulation Exercises

Simulation of Dairi's 2022–2023 planning cycle using D-SMART demonstrated:

- 14% improvement in RPJMD–APBD alignment,
- Integration of 9 previously excluded community proposals,
- Dynamic mid-year adjustment to 6 underperforming programs.

D. Sensitivity checks

Cross-checking budget execution data revealed that D-SMART's adaptive review cycles could have identified and corrected policy lags at least one quarter earlier than current mechanisms.

3.5 Discussion

The classical CIPP (Context, Input, Process, Product) model, though foundational in evaluation theory, struggles to address the complexities of decentralized, SDG-oriented governance. Its limitations—static sequencing, weak stakeholder integration, and lack of digital feedback—are increasingly incompatible with the adaptive demands of modern policy environments [28, 33, 34].

This study positions the D-SMART model as a strategic upgrade, retaining CIPP's structured logic while embedding digital tools, participatory mechanisms, and real-time performance tracking. Each CIPP element is re-engineered: *Context* integrates live sectoral data; *Input* aligns strategic and fiscal codes; *Process* introduces digital review cycles; *Product* emphasizes SDG-linked outcomes; and a fifth domain—*Governance*—institutionalizes stakeholder inclusion (Table 7).

These innovations position D-SMART as a hybrid governance tool that bridges evaluation, strategic planning, and participatory oversight. Unlike prior adaptations (e.g., CIPPO), D-SMART fully integrates data, decentralization,

and democracy, making it highly relevant for SDG localization and responsive governance [30, 31, 35].

Table 7. Comparative framework: classical CIPP vs. D-SMART innovations

Component	CIPP Focus	D-SMART Advancement
Context	Needs-based	Real-time SIPD data
Input	Planning logic	Policy–budget alignment
Process	Implementation monitoring	Quarterly digital reviews
Product	Output evaluation	SDG-linked outcome metrics
Governance	Not covered	Stakeholder evaluation boards

3.6 Comparative review of evaluation models

While the classical CIPP framework remains a widely used foundation for program evaluation in governance contexts, alternative models such as CIPPO, the Kirkpatrick Model, and Logic Models also offer unique evaluative logics that merit discussion.

The CIPPO Model, an extension of CIPP, introduces an additional "Outcomes" component to better reflect long-term impact. However, it remains largely linear and does not explicitly embed digital adaptability or participatory structures, which are central to decentralized governance.

The Kirkpatrick Model, originally designed for training evaluation, focuses on four levels: Reaction, Learning, Behavior, and Results. Although robust for capacity-building programs, it lacks policy alignment tools and does not emphasize citizen participation or data integration—key elements in the D-SMART model.

The Logic Model visualizes causal chains between inputs, activities, outputs, and outcomes. It is widely used in development evaluation but is often criticized for its static structure and limited applicability in complex, multi-stakeholder environments. D-SMART, by contrast, emphasizes adaptive feedback loops and cyclical responsiveness.

Thus, D-SMART fills a crucial gap by integrating participatory governance, digital platforms, and SDG alignment within an adaptive and performance-oriented framework (Table 8).

Table 8. Summarizes how D-SMART compares across key criteria

Model	Participation	Digital Integration	Policy Alignment	SDG Linkage	Feedback Cycles
CIPP	Limited	No	Moderate	Indirect	Annual/Static
CIPPO	Low	No	Low	Indirect	Outcome-focused
Kirkpatrick	None	No	Low	Not applicable	Linear
Logic Model	Limited	No	Indirect	Weak	Static
D-SMART	High	Yes	High	Explicit	Triannual

4. CONCLUSION AND POLICY IMPLICATION

4.1 Conclusion

This study introduced the D-SMART model as a participatory, adaptive, and performance-based evaluation framework tailored for decentralized governance. Grounded in a redesign of the classical CIPP model, D-SMART integrates

real-time data systems (e.g., SIPD), program alignment tools, and stakeholder-driven evaluation to address persistent gaps in regional planning—such as plan–budget incoherence, procedural participation, and static evaluation cycles.

Applied to Dairi Regency, the model revealed:

- A 40% gap between strategic goals and budget execution,
- Underutilization of digital tools for planning and

feedback,

- Symbolic participation without evaluative influence.

As a contextualized application of the broader EPABKD framework, the D-SMART model demonstrated that adaptive, participatory, and performance-based evaluation systems can significantly enhance coherence, responsiveness, and citizen inclusion in local governance.

4.2 Policy implications

The study identifies five key policy actions for institutionalizing the D-SMART model in decentralized governance contexts. To support implementation planning, these recommendations are prioritized based on two criteria: feasibility of adoption (technical/legal readiness) and urgency of need (based on gaps identified during the study). Table 9 below presents the ranked implications.

Table 9. Prioritized policy recommendations for local governments

Policy Recommendation	Description	Priority
Institutionalize Stakeholder Evaluation Boards	Legalize and fund formal evaluation boards to review planning performance quarterly.	High
Operationalize the Program Alignment Index (PAI)	Integrate PAI into local planning systems (e.g., BAPPEDA tools) to ensure RPJMD–APBD coherence.	High
Upgrade SIPD Functionality	Move beyond passive reporting by activating dashboards and integrating review triggers.	Medium
Establish Participatory Feedback Loops	Implement triannual digital reviews with community scoring of government programs.	Medium
Embed SDG-Based Performance Indicators	Replace activity-based indicators with outcome-based KPIs aligned with SDG targets.	Low

This prioritization reflects the immediate need for institutional and operational coherence mechanisms, while also recognizing the medium-term importance of participatory and digital integration. Long-term reforms such as SDG indicator embedding require broader institutional shifts and thus follow in sequence.

Limitations and Future Research

While this study provides a contextually grounded evaluation model for adaptive local governance, several limitations must be acknowledged.

- Context-specific application: The D-SMART model was developed and tested in a single regency (Dairi, North Sumatra). Although Dairi reflects many typical features of decentralized planning in Indonesia, the findings may not be fully generalizable to regions with significantly different institutional, fiscal, or political characteristics.
- Stakeholder subjectivity: Interviews and participatory feedback loops rely on perceptions and qualitative judgments. While triangulation and coding procedures were applied to mitigate bias, future research may incorporate longitudinal or quantitative measures to validate observed patterns.

- Data availability and access: Some digital system data (e.g., full SIPD performance dashboards) were incomplete or underutilized at the local level, potentially limiting comprehensive assessment.
- Political influence on planning: Observations and interviews indicated that political bargaining and elite negotiation influence budget allocation processes, which may affect the adoption of formal alignment and feedback mechanisms like those embedded in D-SMART.

Future research should test D-SMART’s applicability in other decentralized governance contexts—both within and outside Indonesia—and examine its scalability under varying degrees of digital capacity, civic engagement, and institutional maturity.

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