

# Agile Governance as a Predictor of Traffic Management Service Quality: A Quantitative Study of Local Government Technology-Based Public Services in Indonesia

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## ABSTRACT

Traffic management systems in Indonesian local governments increasingly rely on technology-based infrastructure such as the Area Traffic Control System (ATCS); however, the governance framework underpinning these systems remains insufficiently examined in the public administration literature. This study investigates the effect of Agile Governance on ATCS service quality in West Bandung Regency, Indonesia, contributing empirical evidence on how adaptive, citizen-centered governance shapes technology-driven public service performance at the sub-national level. A quantitative associative-correlational design was employed, with data collected through a structured questionnaire survey of 437 road users on ATCS-monitored routes. Structural Equation Modeling–Partial Least Squares (SEM-PLS) was used to examine hypothesized relationships between the two constructs. Agile Governance was operationalized through six dimensions—Good Enough Governance, Business-Driven, Human-Focused, Based on Quick Wins, Systematic and Adaptive Approach, and Simple Design and Continuous Refinement—while service quality was measured using the SERVQUAL framework (Tangibles, Reliability, Responsiveness, Assurance, and Empathy). Descriptive results indicated that Agile Governance scored 80.19% (Good), with Simple Design and Continuous Refinement as the highest dimension (81.00%, Very Good), while overall ATCS service quality reached 79.14% (Good), with Responsiveness recording the lowest score (78.56%). SEM-PLS analysis revealed that Agile Governance exerts a positive and statistically significant effect on ATCS service quality (path coefficient = 0.793, t-statistic = 30.869,  $p < 0.001$ ,  $R^2 = 0.629$ ). These findings establish Agile Governance as a robust predictor of technology-based public service quality, with practical implications for local government traffic management policy and public sector governance reform in developing countries.

**Keyword:** Agile Governance; Area Traffic Control System; Local government; Service quality; SEM-PLS.

## INTRODUCTION

Local governments in developing countries face a persistent governance challenge: deploying technology-based systems for public service delivery under conditions of constrained administrative capacity, fragmented authority, and institutional inertia. This tension is particularly visible in urban traffic management, where the technical sophistication of deployed systems has increasingly outpaced the governance capacity needed to operate them effectively. The Area Traffic Control System (ATCS)—a centralized, sensor-driven platform for adaptive traffic signal management—represents one of the most operationally demanding public service technologies that district-level governments in Indonesia are required to govern. Whether governance quality at the operating agency level translates into citizen-perceived service quality is a question with both theoretical and practical consequence.

The Indonesian regulatory framework provides the normative context for this challenge. Law No. 23 of 2014 on Regional Government formally assigned transport management—including traffic control infrastructure—to district and city governments as a mandatory service function (Republic of Indonesia, 2014). This arrangement

places ATCS governance within the jurisdiction of local transportation agencies (*Dinas Perhubungan*), which are required to coordinate with traffic police and regional planning bodies under significant fiscal constraints. Government Regulation No. 79 of 2013 and Law No. 22 of 2009 on Road Traffic and Transport further mandate technology-based approaches to traffic management (Republic of Indonesia, 2009, 2013), reinforcing the expectation that local governments adopt adaptive, outcome-oriented governance arrangements.

West Bandung Regency (*Kabupaten Bandung Barat*, KBB) constitutes the empirical setting for this study. As a high-growth district adjacent to Bandung city and a major regional tourism corridor, KBB experiences persistently high traffic volumes on arterial routes connecting its principal subdistricts. The regency operates an ATCS under the normative framework of West Bandung Regency Local Regulation No. 6 of 2019 on Transportation (West Bandung Regency Government, 2019). Despite the investment in this system, the operating agency has documented ongoing limitations in network coverage, inter-agency response coordination, and the systematic use of monitoring data for adaptive traffic management. These conditions indicate that the primary constraint on system performance is governance-related rather than purely technical—a pattern consistent with the broader literature on technology-enabled public service reform in decentralized settings (Smoke, 2003).

This observation points to a gap in the theoretical literature. Scholarship on technology-enabled public services has examined e-government service quality, institutional readiness, and citizen trust as determinants of service outcomes (Papadomichelaki & Mentzas, 2012; Reddick & Turner, 2012; Carter & Bélanger, 2005). However, governance *agility*—defined as an adaptive, outcome-oriented, and user-centered governance orientation—has rarely been examined as a direct structural predictor of citizen-perceived service quality in technology-based public infrastructure at the local government level. Luna, Marinho, and Moura (2020) developed and empirically operationalized an Agile Governance framework in a peer-reviewed study, establishing it as a testable construct for this purpose; yet its application in quantitative public administration research at the sub-national level remains limited.

The SERVQUAL framework (Parasuraman et al., 1988) provides the measurement approach for service quality. While extensively applied in e-government and public service contexts (Papadomichelaki & Mentzas, 2012), its use in evaluating technology-based traffic management services governed by local authorities has not been examined through structural quantitative methods.

This study addresses that intersection. Employing a quantitative associative-correlational design and SEM-PLS analysis with data from 437 road users in West Bandung Regency, it tests the hypothesis that Agile Governance positively predicts ATCS service quality. The central research question is: *To what extent does Agile Governance predict the service quality of a technology-based traffic management system in a local government setting?*

The contribution of this study is threefold. First, it provides a SEM-PLS-based empirical test of Agile Governance as a predictor of technology-enabled public service quality at the district government level in Indonesia. Second, it extends the SERVQUAL framework to a technology-based traffic management context, demonstrating its applicability beyond conventional service encounters. Third, it generates evidence relevant to local government reform and transport governance policy in a decentralized, resource-constrained, developing-country context.

## LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### Agile Governance: Conceptual Foundations and Operationalization

Agile Governance emerged from an effort to translate the principles of agile software development—iterative improvement, adaptive planning, and cross-functional collaboration—into the domain of public and organizational governance. The framework's conceptual foundations were laid through a theory-building process applying Dubin's method, proposing governance as a dynamic, citizen-oriented capacity for responsive decision-making rather than a procedural hierarchy (Luna et al., 2015). Luna, Marinho, and Moura (2020) subsequently operationalized this framework in a peer-reviewed empirical study published in *Innovations in Systems and Software Engineering*, developing testable indicators for each dimension and demonstrating the framework's

applicability to organizational and public-sector governance contexts. The operationalization study (Luna et al., 2020) is the primary empirical foundation for the present research and its measurement instrument.

The operationalized framework identifies six dimensions that distinguish agile from conventional bureaucratic governance (Luna et al., 2020). *Good Enough Governance* prioritizes sufficient decision-making capacity that enables responsiveness over procedural completeness. *Business-Driven* governance orients resource allocation and operational decisions toward service outcomes rather than compliance metrics. *Human-Focused* governance treats citizen needs as the primary driver of system design and adaptation. *Based on Quick Wins* favors incremental, demonstrable improvements over deferred comprehensive reform. *Systematic and Adaptive Approach* captures the capacity to learn from operational feedback and adjust configurations in response to changing conditions. *Simple Design and Continuous Refinement* emphasizes procedural simplicity and iterative operational improvement.

In a local government context characterized by multi-agency coordination, fluctuating service demands, and direct citizen exposure to system outputs, these dimensions represent measurable governance dispositions rather than abstract organizational ideals.

### Service Quality in Technology-Enabled Public Services

SERVQUAL, developed by Parasuraman, Zeithaml, and Berry (1988), remains among the most widely applied and empirically validated frameworks for measuring service quality across sectors. Built on the conceptual gap model introduced by the same authors (Parasuraman et al., 1985), SERVQUAL evaluates service quality through five dimensions: Tangibles, Reliability, Responsiveness, Assurance, and Empathy. Its application has been extended to public administration and e-government contexts; Papadomichelaki and Mentzas (2012), developing the e-GovQual instrument, demonstrated that dimensions of tangibility, reliability, responsiveness, and trust retain operational relevance in technology-mediated government service delivery.

In the ATCS context, these dimensions carry concrete content. Tangibles reflect the quality and visibility of signal and monitoring infrastructure. Reliability measures whether ATCS-controlled intersections consistently manage traffic flow as designed. Responsiveness captures the speed and consistency with which the system and its operators react to congestion events and citizen feedback. Assurance reflects user perceptions of safety and operational competence. Empathy measures whether the system accommodates the needs of diverse road users. This operationalization establishes SERVQUAL as an appropriate measurement framework for ATCS service quality as experienced by road users.

### Theoretical Linkage: Agile Governance and Service Quality

The theoretical case for a positive association between Agile Governance and ATCS service quality rests on several logically connected mechanisms. Good Enough Governance reduces decision-making latency in operational responses, directly supporting the Responsiveness dimension of service quality. Business-Driven governance aligns resource allocation with traffic performance outcomes, reinforcing service Reliability. Human-Focused governance orients system design and operational protocols toward actual road user needs, strengthening Assurance and Empathy (Luna et al., 2020). Governance systems applying Quick Wins and Continuous Refinement generate incremental improvements that accumulate into tangible service gains. A Systematic and Adaptive Approach closes the feedback loop between citizen experience and system behavior, sustaining service quality across dynamic operating conditions.

These mechanisms indicate that Agile Governance functions as a structural antecedent of service quality in technology-dependent public services. This logic is consistent with the e-government service quality literature, which identifies governance and management capacity as a determinant of citizen-perceived service outcomes (Papadomichelaki & Mentzas, 2012; Reddick & Turner, 2012), and with the decentralization literature demonstrating that local governance quality shapes service delivery performance independently of fiscal endowment (Smoke, 2003; Hofman & Kaiser, 2006).

## Hypothesis

Based on the theoretical framework above, this study advances one structural hypothesis:

H1: Agile Governance has a positive and significant effect on ATCS service quality in West Bandung Regency.

Agile Governance is positioned as the exogenous latent construct and ATCS service quality—measured through five SERVQUAL dimensions—as the endogenous latent construct.

## METHODS

### Research Design

This study employs a quantitative associative-correlational design to examine the directional association between Agile Governance and ATCS service quality. This approach is appropriate when the research objective is to determine whether and to what extent one construct predicts another in the absence of experimental manipulation (Creswell & Creswell, 2018). The unit of analysis is the individual road user who directly experiences ATCS service output, making citizen perception the primary evidentiary basis for service quality assessment (Carter & Bélanger, 2005).

### Study Setting

The study was conducted in West Bandung Regency, a district in West Java Province, Indonesia, that serves simultaneously as a residential corridor and a regional tourism destination, generating persistently high traffic volumes on its arterial road network. The regency's transportation agency operates the ATCS under West Bandung Regency Local Regulation No. 6 of 2019 on Transportation (West Bandung Regency Government, 2019), which mandates technology-based traffic management and citizen-responsive service delivery.

The ATCS has been operational since early 2022 and has been subject to ongoing agency-level evaluation. Multi-agency governance—involving the transportation agency, traffic police, and the regional planning body—provides the substantive rationale for examining governance quality as a predictor of service outcomes, consistent with the decentralization literature on multi-principal local service governance in Indonesia (Smoke, 2003; Hofman & Kaiser, 2006).

### Population, Sample, and Sampling

The target population comprised road users traveling on ATCS-monitored routes in West Bandung Regency. As the population could not be precisely enumerated, sample size was determined following Hair et al.'s (2019) guideline of five to ten observations per indicator for SEM-PLS studies. With 46 final indicators, the minimum required sample was 230 respondents ( $5 \times 46$ ) and the upper guideline was 460 ( $10 \times 46$ ). A sample of 437 respondents was obtained, well within the recommended range. Respondents were selected through purposive sampling at intersections and arterial corridors across the principal traffic zones covered by the system. Inclusion criteria required direct and regular experience with ATCS-monitored road conditions.

### Measurement Instruments

Both constructs were operationalized using reflective measurement models on a five-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree). Agile Governance (X) was operationalized through six dimensions following Luna et al. (2020), adapted to the ATCS governance context.

ATCS Service Quality (Y) was operationalized through five SERVQUAL dimensions (Parasuraman et al., 1988), adapted to the technology-based traffic management context within the normative scope of Local Regulation No. 6 of 2019 (West Bandung Regency Government, 2019). Tables 1 and 2 present the retained indicators following removal of invalid items.

Table 1. Agile Governance Construct: Dimensions and Retained Indicators

| Dimension                               | Code | Retained Indicators  |
|-----------------------------------------|------|----------------------|
| Good Enough Governance                  | X1   | 3 (X1.1, X1.2, X1.3) |
| Business-Driven                         | X2   | 4 (X2.1–X2.4)        |
| Human-Focused                           | X3   | 4 (X3.1–X3.4)        |
| Based on Quick Wins                     | X4   | 4 (X4.1–X4.4)        |
| Systematic and Adaptive Approach        | X5   | 4 (X5.1–X5.4)        |
| Simple Design and Continuous Refinement | X6   | 3 (X6.1, X6.2, X6.4) |
| Total                                   |      | 22 indicators        |

Note: X1.4 (outer loading = 0.036) and X6.3 (outer loading below 0.60 threshold) excluded.

Table 2. ATCS Service Quality Construct: Dimensions and Retained Indicators

| Dimension      | Code | Retained Indicators |
|----------------|------|---------------------|
| Tangibles      | Y1   | 4 (Y1.1–Y1.4)       |
| Reliability    | Y2   | 4 (Y2.1, Y2.3–Y2.5) |
| Responsiveness | Y3   | 5 (Y3.1–Y3.5)       |
| Assurance      | Y4   | 5 (Y4.1–Y4.5)       |
| Empathy        | Y5   | 5 (Y5.1–Y5.5)       |
| Total          |      | 23 indicators       |

Note: Y2.2 (outer loading = 0.170) excluded.

## Data Collection

Data were collected through a structured questionnaire administered directly at ATCS-monitored road locations across West Bandung Regency.

The instrument underwent face validity review and pilot testing prior to full deployment. Respondents completed the questionnaire independently, with enumerators available to clarify item wording where necessary. Participation was voluntary. Data collection was carried out during the research period of October 2025 to April 2026.

## Analytical Strategy

Structural Equation Modeling–Partial Least Squares (SEM-PLS) was selected as the analytical method for three reasons. First, both Agile Governance and ATCS service quality are latent constructs requiring inference through multiple reflective indicators, a structure for which PLS-SEM is well suited (Hair et al., 2019).

Second, PLS-SEM does not impose multivariate normality assumptions and performs reliably with complex measurement models and moderate-to-large samples (Hair et al., 2011). Third, the study's directional, predictive research objective aligns with the confirmatory-predictive orientation of PLS-SEM (Hair et al., 2019). Analysis was conducted using SmartPLS.

The outer model was evaluated through: indicator reliability via outer loadings (threshold  $\geq 0.60$ ); internal consistency via Cronbach's Alpha and Composite Reliability (threshold  $\geq 0.70$ ); convergent validity via Average Variance Extracted (AVE; threshold  $\geq 0.50$ ; Fornell & Larcker, 1981); and discriminant validity via the Fornell-Larcker criterion and cross-loading inspection (Fornell & Larcker, 1981).

The inner model was evaluated through the path coefficient ( $\beta$ ), bootstrapping-derived *t*-statistics (5,000 resamples; threshold  $> 1.96$  for  $p < 0.05$ ), and the coefficient of determination ( $R^2$ ). Effect size was interpreted following Cohen (1988) as applied to PLS-SEM social science contexts (Hair et al., 2019), with  $R^2$  values above 0.50 considered substantial.

## RESULTS

### Respondent Profile

Table 3 presents the socio-demographic profile of the 437 respondents. The sample was predominantly male (61.6%), concentrated in the under-30 age cohort (81.9%), and most commonly educated to senior high school level (54.2%). Motorcycle was the dominant transport mode (72.3%), reflecting the prevailing mobility pattern on arterial roads in this district. A majority (60.0%) used ATCS-monitored roads daily, establishing strong experiential relevance for service quality assessment.

Table 3. Respondent Profile (n = 437)

| Characteristic     | Category           | n   | %    |
|--------------------|--------------------|-----|------|
| Sex                | Male               | 269 | 61.6 |
|                    | Female             | 168 | 38.4 |
| Age                | ≤ 30 years         | 358 | 81.9 |
|                    | 31–40 years        | 45  | 10.3 |
|                    | 41–50 years        | 21  | 4.8  |
|                    | > 50 years         | 13  | 3.0  |
| Education          | Primary school     | 6   | 1.4  |
|                    | Junior high school | 89  | 20.4 |
|                    | Senior high school | 237 | 54.2 |
|                    | Diploma            | 26  | 5.9  |
|                    | Bachelor's degree  | 52  | 11.9 |
|                    | Master's/Doctoral  | 27  | 6.2  |
| Transport mode     | Motorcycle         | 316 | 72.3 |
|                    | Private car        | 65  | 14.9 |
|                    | Public transport   | 38  | 8.7  |
|                    | Other              | 18  | 4.1  |
| Road use frequency | Daily              | 262 | 60.0 |
|                    | Weekly             | 89  | 20.4 |
|                    | Monthly            | 86  | 19.7 |

### Descriptive Analysis

Agile Governance. Table 4 presents the aggregated descriptive scores for the six Agile Governance dimensions. Overall Agile Governance scored 80.19% (*Good*). Simple Design and Continuous Refinement was the highest-performing dimension (81.00%, *Very Good*), indicating that road users perceived ATCS governance as characterized by relatively streamlined procedures and iterative improvement. Good Enough Governance recorded the lowest score (79.43%), indicating that decision-making speed and procedural responsiveness retain the greatest room for improvement within the governance framework.

Table 4. Agile Governance: Descriptive Scores by Dimension

| Dimension                               | Score (%) | Category  |
|-----------------------------------------|-----------|-----------|
| Good Enough Governance                  | 79.43     | Good      |
| Business-Driven                         | 80.97     | Good      |
| Human-Focused                           | 79.95     | Good      |
| Based on Quick Wins                     | 79.65     | Good      |
| Systematic and Adaptive Approach        | 80.15     | Good      |
| Simple Design and Continuous Refinement | 81.00     | Very Good |
| Overall Agile Governance                | 80.19     | Good      |

ATCS Service Quality. Table 5 presents descriptive scores for the five SERVQUAL dimensions. Overall ATCS service quality reached 79.14% (*Good*). Assurance recorded the highest score (79.53%), reflecting user confidence in the safety and operational competence associated with ATCS-monitored routes. Responsiveness recorded the lowest score (78.56%), indicating that road users perceive the speed of system and operator reaction to disruptions and feedback as the weakest aspect of service delivery.

Table 5. ATCS Service Quality: Descriptive Scores by SERVQUAL Dimension

| Dimension                    | Score (%) | Category       |
|------------------------------|-----------|----------------|
| Tangibles                    | 78.65     | Good           |
| Reliability                  | 79.52     | Good           |
| Responsiveness               | 78.56     | Good (lowest)  |
| Assurance                    | 79.53     | Good (highest) |
| Empathy                      | 79.41     | Good           |
| Overall ATCS Service Quality | 79.14     | Good           |

### Measurement Model

Three indicators were excluded following initial estimation due to outer loadings below the 0.60 threshold: X1.4 (0.036), X6.3 (below threshold), and Y2.2 (0.170). The final model retained 22 Agile Governance indicators and 23 service quality indicators.

All retained indicators achieved outer loadings  $\geq 0.63$ , confirming indicator reliability (Hair et al., 2019). All AVE values exceeded 0.50, confirming convergent validity (Fornell & Larcker, 1981). Composite Reliability and Cronbach's Alpha exceeded 0.70 for all constructs and dimensions, confirming internal consistency. Discriminant validity was assessed through the Fornell-Larcker criterion, with the square root of each construct's AVE exceeding its highest inter-construct correlation, and through cross-loading inspection, confirming that each indicator loaded most strongly on its intended construct (Fornell & Larcker, 1981). Table 6 presents the complete measurement model statistics.

Table 6. Measurement Model: Second-Order Loadings, AVE, Composite Reliability, and Cronbach's Alpha

| Construct / Dimension               | Outer Loading ( $\lambda$ ) | AVE   | CR    | $\alpha$ |
|-------------------------------------|-----------------------------|-------|-------|----------|
| Agile Governance                    | —                           | 0.689 | 0.930 | 0.908    |
| Good Enough Governance (X1)         | 0.735                       | 0.577 | 0.801 | 0.635    |
| Business-Driven (X2)                | 0.858                       | 0.626 | 0.870 | 0.801    |
| Human-Focused (X3)                  | 0.884                       | 0.624 | 0.869 | 0.799    |
| Based on Quick Wins (X4)            | 0.857                       | 0.628 | 0.871 | 0.802    |
| Systematic & Adaptive Approach (X5) | 0.870                       | 0.634 | 0.874 | 0.808    |
| Simple Design & Refinement (X6)     | 0.821                       | 0.688 | 0.868 | 0.772    |
| ATCS Service Quality                | —                           | 0.791 | 0.950 | 0.934    |
| Tangibles (Y1)                      | 0.849                       | 0.698 | 0.902 | 0.855    |
| Reliability (Y2)                    | 0.913                       | 0.655 | 0.883 | 0.824    |
| Responsiveness (Y3)                 | 0.914                       | 0.677 | 0.913 | 0.880    |
| Assurance (Y4)                      | 0.912                       | 0.660 | 0.906 | 0.870    |
| Empathy (Y5)                        | 0.888                       | 0.657 | 0.905 | 0.869    |

CR = Composite Reliability;  $\alpha$  = Cronbach's Alpha.

### Structural Model and Hypothesis Testing

Path coefficients and *t*-statistics were derived through bootstrapping with 5,000 resamples (Hair et al., 2019). Table 7 presents the main structural result.

Table 7. Structural Model Results: H1 Test

| Path                                    | $\beta$ | <i>t</i> -statistic | <i>p</i> -value | R <sup>2</sup> | Decision     |
|-----------------------------------------|---------|---------------------|-----------------|----------------|--------------|
| Agile Governance → ATCS Service Quality | 0.793   | 30.869              | < 0.001         | 0.629          | H1 Supported |

The path coefficient of 0.793 indicates a strong positive association. The *t*-statistic of 30.869 exceeds both the 1.96 threshold ( $p < 0.05$ ) and the 2.576 threshold ( $p < 0.01$ ), confirming statistical significance at  $p < 0.001$ . R<sup>2</sup> = 0.629 indicates that Agile Governance accounts for 62.9% of the variance in ATCS service quality—a strong effect under Cohen's (1988) guidelines as applied to PLS-SEM social science contexts (Hair et al., 2019). The remaining 37.1% of variance is attributable to factors outside the model.

Tables 8 and 9 present the sub-structural paths for each construct's constituent dimensions.

Table 8. Sub-Structural Paths: Agile Governance → Its Six Dimensions

| Path                                | $\beta$ | R <sup>2</sup> (%) | <i>t</i> -statistic | <i>p</i> -value |
|-------------------------------------|---------|--------------------|---------------------|-----------------|
| AG → Good Enough Governance         | 0.781   | 61.00              | 31.690              | < 0.001         |
| AG → Business-Driven                | 0.858   | 73.62              | 48.518              | < 0.001         |
| AG → Human-Focused                  | 0.884   | 78.15              | 66.205              | < 0.001         |
| AG → Based on Quick Wins            | 0.857   | 73.45              | 40.889              | < 0.001         |
| AG → Systematic & Adaptive Approach | 0.870   | 75.69              | 58.380              | < 0.001         |
| AG → Simple Design & Refinement     | 0.821   | 67.40              | 39.835              | < 0.001         |

Table 9. Sub-Structural Paths: ATCS Service Quality → Its Five SERVQUAL Dimensions

| Path                | $\beta$ | R <sup>2</sup> (%) | <i>t</i> -statistic | <i>p</i> -value |
|---------------------|---------|--------------------|---------------------|-----------------|
| SQ → Tangibles      | 0.849   | 72.02              | 42.099              | < 0.001         |
| SQ → Reliability    | 0.913   | 83.40              | 86.956              | < 0.001         |
| SQ → Responsiveness | 0.914   | 83.49              | 69.742              | < 0.001         |
| SQ → Assurance      | 0.912   | 83.12              | 75.786              | < 0.001         |
| SQ → Empathy        | 0.888   | 78.78              | 55.295              | < 0.001         |

Human-Focused recorded the highest path coefficient among Agile Governance dimensions ( $\beta = 0.884$ , R<sup>2</sup> = 78.15%), while Good Enough Governance recorded the lowest ( $\beta = 0.781$ , R<sup>2</sup> = 61.00%). For service quality, Responsiveness and Reliability were the most strongly constituted dimensions ( $\beta = 0.914$  and 0.913 respectively), while Tangibles registered the lowest loading ( $\beta = 0.849$ ). These results provide robust support for H1 across all constituent dimensions of both constructs.

## DISCUSSION

### Agile Governance as a Structural Predictor of Service Quality

The confirmed association between Agile Governance and ATCS service quality ( $\beta = 0.793$ ,  $t = 30.869$ ,  $p < 0.001$ , R<sup>2</sup> = 0.629) establishes governance agility as a substantively important predictor of technology-based public service performance at the local government level. The explanatory power of R<sup>2</sup> = 0.629 is classified as a strong effect under Cohen's (1988) guidelines and exceeds R<sup>2</sup> values typically reported in public administration structural models (Hair et al., 2019).

The public administration literature has generally operationalized governance capacity in terms of institutional design, fiscal resources, or bureaucratic competence (Smoke, 2003; Hofman & Kaiser, 2006). The present findings suggest that a governance orientation characterized by outcome focus, user-centricity, iterative improvement, and reduced procedural friction explains a large share of variance in citizen-perceived service quality even when the service is delivered through a technology platform rather than direct human-to-citizen interaction. This pattern indicates that in technology-enabled public service settings, governance agility functions as a mechanism through which technical capacity is converted into service quality as perceived by users—consistent with the e-government service quality literature identifying management and governance

capacity of the operating agency as a determinant of service outcomes (Papadomichelaki & Mentzas, 2012; Reddick & Turner, 2012).

### **The Structural Dominance of Human-Focused and Systematic & Adaptive Governance**

Among the six dimensions, Human-Focused ( $\beta = 0.884$ ,  $R^2 = 78.15\%$ ) and Systematic and Adaptive Approach ( $\beta = 0.870$ ,  $R^2 = 75.69\%$ ) recorded the highest path coefficients. Luna et al. (2020) identify citizen-centricity as the normative core of Agile Governance, proposing that governance systems oriented toward user needs demonstrate higher adaptive capacity and service orientation. The structural results here provide empirical support for that proposition in an applied local government context: when road users perceive the operating agency as user-oriented, their overall governance quality assessment responds most strongly.

The strong constitution of Systematic and Adaptive Approach ( $\beta = 0.870$ ) indicates that user perceptions are substantially shaped by observable evidence of feedback-driven, learning-oriented management. The relatively strong descriptive score for this dimension (80.15%, *Good*) suggests that a foundational level of adaptive management capacity is present, even if not fully developed.

Good Enough Governance recorded both the lowest descriptive score (79.43%) and the lowest structural path coefficient ( $\beta = 0.781$ ,  $R^2 = 61.00\%$ ). In a setting where governance responsibilities are distributed across agencies with partially overlapping mandates, the dimension most directly associated with decision-making speed faces the greatest institutional constraint. The higher residual variance for this dimension implies that factors external to the Agile Governance framework—including inter-agency coordination protocols, authority allocation, and budget control—account for a meaningful share of its variance. This is a contextually grounded indication of where institutional reform is most needed and is consistent with the decentralization literature on coordination challenges in Indonesian district governance (Hofman & Kaiser, 2006).

### **Responsiveness: The Central Yet Underperforming Service Quality Dimension**

Responsiveness recorded the lowest descriptive score (78.56%) yet the highest structural path coefficient from the service quality construct ( $\beta = 0.914$ ,  $R^2 = 83.49\%$ ). This pattern reveals a consequential asymmetry: Responsiveness is simultaneously the most central component of road users' service quality judgment and the dimension on which current performance is weakest.

When citizens evaluate ATCS service quality, their aggregate assessment is most strongly anchored in how responsive the system and its operators appear to be (Parasuraman et al., 1988). This finding is consistent with e-government service quality research identifying responsiveness as the dimension most strongly associated with citizen satisfaction and service engagement (Reddick & Turner, 2012; Carter & Bélanger, 2005). The structural alignment between the weakest Agile Governance dimension (Good Enough Governance) and the weakest service quality dimension (Responsiveness) is theoretically coherent: decision-making constraints at the governance level propagate directly into service-level responsiveness deficits. Improving governance agility in decision-making speed and procedural simplification is therefore simultaneously a governance reform and a service quality intervention.

### **Contextual Contribution: District-Level Governance and Service Quality**

West Bandung Regency exemplifies a governance context that is numerically dominant in Indonesia yet underrepresented in quantitative public administration research, which has tended to focus on national agencies or metropolitan governments (Hofman & Kaiser, 2006). The finding that an adaptive, user-centered governance orientation explains 62.9% of variance in citizen-perceived service quality in a district government operating under fiscal and administrative constraints suggests that governance agility is a meaningful service improvement lever that does not require commensurate capital investment. This is consistent with the decentralization literature's observation that governance quality shapes service delivery outcomes at the local level independently of resource endowment (Smoke, 2003; Hofman & Kaiser, 2006), and with the Agile Governance literature's proposition that adaptive governance is accessible to organizations at varying resource levels (Luna et al., 2020).

## CONCLUSION

This study examined whether Agile Governance predicts the service quality of a technology-based traffic management system in a local government context. Employing a quantitative associative-correlational design, SEM-PLS analysis, and data from 437 road users in West Bandung Regency, Indonesia, the study finds strong support for a positive and statistically significant association. Agile Governance predicts ATCS service quality ( $\beta = 0.793$ ,  $t = 30.869$ ,  $p < 0.001$ ), explaining 62.9% of its variance.

Three substantive conclusions follow. First, governance agility is a strong predictor of technology-based public service quality at the local government level—the governance framework surrounding a system is as consequential to perceived service quality as the system's technical specifications. Second, Human-Focused and Systematic and Adaptive Approach are the most strongly constitutive Agile Governance dimensions in this context, indicating that citizen-centricity and adaptive feedback management are the primary mechanisms through which governance agility translates into service quality. Third, Responsiveness is simultaneously the most central SERVQUAL dimension in road users' service quality judgments and the dimension on which current ATCS performance is weakest, identifying the most critical convergence point between governance improvement and service quality gain.

The theoretical contribution lies in the empirical operationalization and structural testing of Agile Governance (Luna et al., 2020) as a predictor construct in a technology-enabled public service context, extending both this framework and the SERVQUAL tradition (Parasuraman et al., 1985; Parasuraman et al., 1988) to a domain where neither has previously been tested with this methodological approach. These conclusions are appropriately bounded by the study's cross-sectional design, single-setting scope, and reliance on citizen perception data. The 37.1% of unexplained variance indicates that infrastructure quality, inter-agency coordination, and organizational leadership independently shape ATCS service outcomes and warrant further investigation.

## Practical Implications

For local transportation agencies operating ATCS or comparable traffic management technologies, the most actionable implication concerns Responsiveness. Given that road users anchor their overall service quality judgments most strongly in how responsive the system and its operators appear to be, governance mechanisms that accelerate operational decision-making—formalized incident response protocols, clearly assigned operational authority, and real-time decision tools—are likely to yield the highest marginal returns in citizen-perceived service quality. Good Enough Governance's comparatively low descriptive score indicates that reducing procedural friction in operational decisions is the governance priority most directly linked to service quality improvement.

For local government leadership and planners, the study demonstrates that an adaptive governance orientation—characterized by citizen-centricity, outcome focus, and systematic feedback integration—is a cost-effective service improvement lever. Reorienting governance practices toward the core principles of Agile Governance (Luna et al., 2020) requires organizational commitment and procedural redesign rather than large capital outlays, making this reform pathway accessible to resource-constrained district governments.

For national and provincial policy frameworks anchored in Government Regulation No. 38 of 2017 on Regional Innovation (Republic of Indonesia, 2017), this study provides empirical justification for incorporating governance agility assessment into technology-based public service evaluation. Monitoring governance agility alongside technical performance indicators would provide a more complete basis for understanding and explaining variation in ATCS service quality across Indonesian districts.

## Limitations And Future Research

Cross-sectional design. Data were collected at a single point in time, meaning the observed association reflects a cross-sectional relationship rather than a developmental trajectory. Whether improvements in governance agility lead to measurable improvements in service quality over time cannot be determined from the present data.

Longitudinal or panel designs would allow examination of temporal dynamics in governance-quality relationships in technology-based public services.

Single-setting generalizability. The study was conducted in one district in West Java. While West Bandung Regency is broadly representative of Indonesian district-level governments, its specific governance structure and service context may limit direct transferability to other settings. Comparative multi-district studies across contexts with varying fiscal capacity and administrative arrangements would strengthen generalizability.

Unexplained variance. The 37.1% of unexplained variance points to factors outside the model that independently shape ATCS service quality. Leadership commitment at the agency level may moderate how effectively Agile Governance principles are translated into operational practice (Luna et al., 2020). Budget commitment and policy support at regional and provincial levels constrain the resource envelope within which governance agility can be exercised (Smoke, 2003). Digital literacy among road users may moderate how governance-related service quality is evaluated (Carter & Bélanger, 2005). Network infrastructure quality represents a technical input variable whose independent contribution to service quality warrants dedicated measurement (Papadomichelaki & Mentzas, 2012).

Perception-based measurement. Service quality is operationalized through user perceptions rather than objective system performance metrics. Future research integrating objective operational data with perception-based survey data would provide a more complete account of the governance–service quality relationship. Testing purpose-built service quality instruments designed for Intelligent Transport System contexts would further clarify whether the SERVQUAL structure fully captures the dimensions most salient to ATCS users (Parasuraman et al., 1988).

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