Global Journal of Advanced
Research and Reviews
Journal homepage: https://gsjournals.com/gjarr/
ISSN: 2980-423X (Online)

(RESEARCH ARTICLE)

EVIDENCE GATED ROOT CAUSE DIAGNOSIS FOR FINTECH MICROSERVICES UNDER TELEMETRY LOSS

Chidera Omoyemi Duru [1], Godson N Ozioma [2] and Ijeoma C. Mordi [3,*]

[1] School of Management and Marketing, Westminster Business School, University of Westminster, London, United Kingdom.
[2] Department of Software Engineering, The University of Salford, 43 Crescent, Salford, Greater Manchester, M5 4WT, United Kingdom.
[3] Faculty of Business and Media, Terra Nova University of Borderless Knowledge, 97100 Ragusa, Italy.
* Corresponding Author

ORCID Details
Ijeoma C. Mordi: https://orcid.org/0009-0005-4994-7750

Global Journal of Advanced Research and Reviews, 2026, 04(04), 048–062

Publication history: Received on 27 September 2026; revised on 03 November 2026; accepted on 05 November 2026

Article DOI: https://doi.org/10.58175/gjarr.2026.4.4.0091

Copyright © 2026 Author(s) retain the copyright of this article. This article is published under the terms of the Creative Commons Attribution License 4.0

ABSTRACT

Root cause explanations in financial microservices become operationally useful only when their supporting evidence can be retrieved and checked. This study develops an evidence gated diagnosis framework that separates statistical confidence, evidence availability, and cryptographic integrity. A reproducible computational experiment generates 600 independent synthetic incidents across three abstract failure families and evaluates four nested telemetry missingness conditions, producing 2,400 paired observations. A correlated Gaussian graph model ranks candidate causes; a selective decision rule accepts a diagnosis only when confidence and evidence requirements are satisfied. Across the matched model conditions, unrestricted graph diagnosis achieves 85.6% accuracy, compared with 42.0% for a largest anomaly heuristic. Evidence gating accepts 65.5% of observations without an observed diagnostic error, but rejects 63 correct recommendations beyond confidence filtering alone. Under deliberate model mismatch, accepted accuracy falls to 92.7%, exposing the limits of confidence thresholds. Digital signature tests reject all 1,000 specified integrity violations while accepting deliberately false claims signed by the authorised test key. The contribution is an executable evaluation framework for defensible abstention, rather than evidence of faster human response or regulatory compliance.

Keywords: Root cause analysis; Fintech microservices; Selective prediction; Telemetry provenance; Evidence integrity.

1 INTRODUCTION

Financial applications distribute transaction processing across authentication, account management, ledger posting, external payments, and persistent storage. A disturbance in one dependency can therefore appear as several failures elsewhere. Distributed tracing provides a practical basis for reconstructing these relationships, as illustrated by Dapper [1], while Trace Context [2] and OpenTelemetry [3] support interoperable telemetry collection. Nevertheless, locating an anomalous component and establishing why it should be treated as the initiating cause remain different analytical tasks. The distinction becomes consequential when the most visible timeout belongs to an affected caller and the initiating dependency has only a weak or partially missing signal.

Existing research already addresses substantial parts of this problem. MicroRCA combines performance symptoms and resource utilisation through an attributed graph [4]. The yRCA tool [5] and subsequent work on explaining cascading failures from logs [6] explicitly reconstruct failure explanations. MicroRank uses normal and abnormal traces for latency localisation [7]. These contributions preclude a sweeping claim that microservice diagnosis lacks explanation. A more precise question concerns the conditions under which a diagnostic output can be accepted when its evidence is unavailable, altered, or insufficient for independent reconstruction. This question can complement existing analysers without assuming that they discard their intermediate reasoning.

Explainability guidance distinguishes producing an explanation from ensuring that it reflects the system and acknowledges its limits [8]. Provenance modelling similarly separates entities, activities, and responsible agents [9]. Incident response guidance situates technical investigation within organisational preparation, response, and recovery [10]. These perspectives motivate an evidence record that identifies the incident, model version, inference rule, supporting observations, and review status. Such a record should expose an unsupported recommendation rather than hide its weaknesses behind a fluent account. Institutional governance research reinforces the value of operational documentation [11], while research on calibrated reliance cautions against interpreting technical capability as sufficient justification for trust [12].

Cryptographic mechanisms address a narrower, complementary concern. Secure hashes bind content to digests [13], and digital signatures authenticate a signed record under stated key assumptions [14]. Canonicalisation makes the relevant byte representation reproducible [15]; EdDSA provides a concrete signature construction [16]. Transparency protocols illustrate how additional logging mechanisms can support scrutiny of recorded events [17]. None of these components alone proves that recorded telemetry was truthful when collected, that a causal model is correct, or that an organisation satisfies a regulatory obligation. Consequently, this study uses evidence integrity as a necessary acceptance condition, with diagnostic correctness evaluated separately against known synthetic causes.

Selective prediction offers a suitable decision foundation. Its central tradeoff is between the fraction of cases receiving a prediction and the error among those predictions [18]. Later work develops confidence based rejection [19] and integrated selection mechanisms [20]. Applying this reasoning to incident diagnosis requires an additional distinction: a statistically confident recommendation may still lack an available record from the proposed root service. Conversely, rejecting every incomplete incident can remove many correct recommendations. Reporting accuracy alone conceals this cost. An operational evaluation should therefore report coverage, conditional error, and the fraction of all incidents that receive a correct accepted diagnosis together.

The evaluation treats deferral as a substantive outcome. An accepted recommendation consumes organisational authority, whereas an abstention creates work for another decision maker. Comparing these outcomes requires explicit denominators and a documented loss function, especially when technical confidence and the availability of supporting records materially diverge.

The present contribution is a reproducible coupling of graph likelihood inference, explicit evidence constraints, and signature verification. It asks how missing telemetry changes accepted diagnostic coverage, whether evidence constraints add value beyond confidence filtering, and which failures cryptographic checks can detect. The experiment deliberately uses a small synthetic model rather than claiming equivalence with deployed services or established benchmark suites such as DeathStarBench [21]. Cluster resampling quantifies simulation uncertainty [22], and the interpretation follows risk management principles that connect model limitations to intended use [23]. The resulting framework makes acceptance decisions inspectable while exposing the assumptions that prevent extrapolation to production incident response.

2 METHODOLOGY

We executed a synthetic computational experiment using seven nodes and six caller to dependency edges. Reverse reachability defines which callers can exhibit symptoms when a dependency fails. Three abstract families represent cascading latency, pool saturation, and payload errors through amplitude multipliers of 1.00, 1.15, and 0.85. Each family contains 200 independently seeded incidents with a uniformly sampled root. The same incident receives four nested service record masks with missingness probabilities 0, 0.15, 0.30, and 0.45. These are 2,400 correlated observations of 600 incidents, not independent operational trials.

For candidate root r, graph distance d_{ir} defines expected amplitude: three at the root, two plus $0.4d_{ir}$ at affected callers, and zero elsewhere, before the family multiplier. Expected onset is $0.6d_{ir}$ for affected nodes and four elsewhere. Onset is a synthetic feature, not elapsed response time. Amplitude and onset blocks have independent noise standard deviations 1.1 and 0.8, with shared disturbance standard deviations 0.35 and 0.30. Equation (1) specifies the observed Gaussian model; equation (2) evaluates its posterior under uniform root priors. Missing records remove both features. No parameters are fitted, making the matched model experiment deliberately favourable to likelihood inference.

$$y_O \mid r, f \sim N(\mu_O(r, f), \Sigma_O) \quad (1)$$

$$\Sigma = \mathrm{diag}(\sigma_a^2 I + \tau_a^2 11^T, \sigma_t^2 I + \tau_t^2 11^T) \quad (1a)$$

$$p_r = \frac{\exp(\ell_r)}{\sum_k \exp(\ell_k)} \quad (2)$$

$$\ell_r = -\frac{1}{2}(y_O - \mu_{r,O})^T \Sigma_O^{-1} (y_O - \mu_{r,O}) + \log \pi_r \quad (2a)$$

Four policies use identical observations: largest observed amplitude, unrestricted posterior maximisation, confidence filtering, and evidence gating. With wrong acceptance costing ten units and deferral one unit, posterior acceptance begins at 0.90. Equation (3) adds a retrievable record at the proposed root, at least three observed nodes, and valid integrity checks. These evidence constraints are design assumptions rather than regulatory thresholds. If no record remains, unrestricted policies use a fixed tie rule and selective policies abstain.

$$g = 1\{10(1 - p_{\hat{r}}) \le 1\} \cdot 1\{\hat{r} \in O\} \cdot 1\{|O| \ge 3\} \cdot I_v, \quad \hat{r} = \arg\max_r p_r \quad (3)$$

Each manifest binds incident identity, model and rule identifiers, the proposed root, posterior, and evidence digests. Equation (4) signs the manifest with Ed25519; signatures are detached to avoid self reference. Measurements use decimal strings within a documented restricted JSON encoding. Human review is explicitly absent. We test five integrity violations on 200 records each and separately sign knowingly false conclusions. Equation (5) reports coverage, selective error, and correct accepted yield. Two thousand cluster bootstrap resamples preserve all missingness views of each incident. A fixed stress test reduces root amplitude by forty percent and adds onset noise with standard deviation 1.2, without refitting the diagnostic model.

$$h_j = \mathrm{SHA256}(b_j), \quad M = J(\mathrm{id}, \mathrm{model}, \mathrm{rule}, \hat{r}, p, \{j: h_j\}, \mathrm{review}) \quad (4)$$

$$s = \mathrm{Ed25519.Sign}(sk, \mathrm{domain} \parallel M) \quad (4a)$$

$$I_v = \mathrm{Verify}(pk, s, \mathrm{domain} \parallel M) \cdot B_{id} \cdot \prod_j 1\{\mathrm{SHA256}(b_j) = h_j\} \quad (4b)$$

$$C = n^{-1} \sum_i g_i, \quad R = \frac{\sum_i g_i 1\{\hat{r}_i \ne r_i\}}{\sum_i g_i}, \quad Y = n^{-1} \sum_i g_i 1\{\hat{r}_i = r_i\} \quad (5)$$

Table 1: Experimental design and notation

Element	Specification
Nodes and edges	API→Auth; API→Account; Account→Ledger; Ledger→Payment, Audit, Database
Observation set O	Observed service nodes; y_o contains their amplitude and onset features
Covariance parameters	σ_a=1.1; τ_a=0.35; σ_t=0.8; τ_t=0.30; π_r=1/7
Samples and seed	3 families × 200 independent incidents × 4 masks; seed 20261103
Evidence notation	b_j: evidence bytes; J: restricted encoding; sk/pk: signing/verification keys
Integrity I_v and B_id	B_id checks object-set, node and incident binding; I_v also checks signature and digests
Outcome notation	C: coverage; R: error among accepted cases; Y: correct accepted yield
Primary threshold	0.90 fixed by an illustrative 10:1 error-to-deferral loss ratio
Sensitivity thresholds	0.50, 0.60, 0.70, 0.80, 0.85, 0.90, 0.95, 0.99

3 EMPIRICAL RESULTS FROM SYNTHETIC COMPUTATION

The computational results support a distinction between identifying a plausible cause and authorising its acceptance. Across 2,400 matched model observations, unrestricted graph likelihood correctly identified 2,055 roots, whereas the largest anomaly heuristic identified 1,007. The paired accuracy difference was 43.7 percentage points, with a cluster bootstrap interval of 40.2 to 47.2 points. This comparison tests whether propagation and onset information help within the specified generator. It does not establish superiority over MicroRCA, yRCA, or MicroRank, which were discussed as prior research but were not implemented as experimental comparators.

Missingness substantially weakened unrestricted diagnosis. Accuracy declined from 99.3% with complete records to 92.5%, 81.7%, and 69.0% as missingness increased to 15%, 30%, and 45%, respectively. The largest anomaly heuristic declined from 49.0% to 33.0% over the same conditions. Figure 1 shows both trajectories and the conditional accuracy of the evidence gate. The heuristic disadvantage is partly structural: the generator permits caller symptoms to exceed the initiating amplitude. Its role is a transparent symptom selection baseline, not a proxy for skilled engineers reviewing logs and traces.

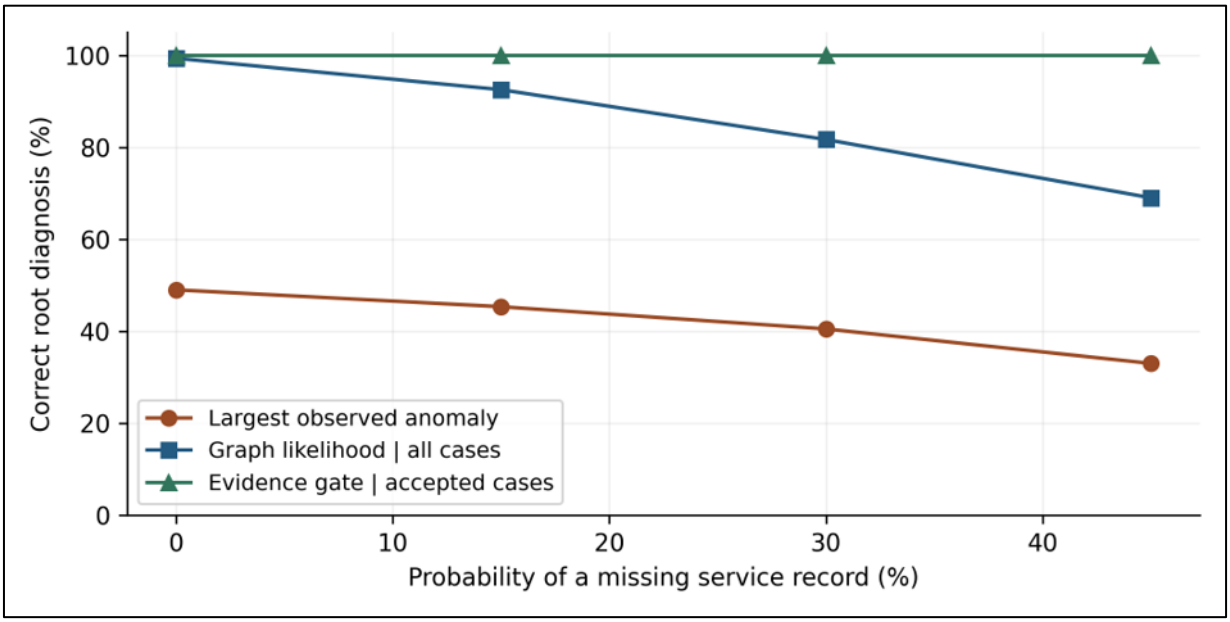


Figure 1: Diagnostic accuracy across nested missingness conditions. Evidence gate accuracy is conditional on acceptance; other curves use all 600 observations per condition. This is synthetic model performance, not measured production reliability.

Table 2: Matched model results with a 0.90 acceptance threshold

Missing %	Anomaly accuracy %	Graph accuracy %	Gate accepted	Gate coverage %	Gate errors
0	49.0	99.3	588/600	98.0	0
15	45.3	92.5	446/600	74.3	0
30	40.5	81.7	325/600	54.2	0
45	33.0	69.0	213/600	35.5	0

At the prespecified 0.90 threshold, confidence filtering accepted 1,637 observations and made two errors. Evidence gating accepted 1,572 observations and made no observed errors, yielding 65.5% coverage with a cluster bootstrap interval of 63.0% to 67.9%. Its conditional accuracy was therefore 100% within this experiment. That result should not be interpreted as a guarantee: the test uses one topology and a diagnostic likelihood matched to its generating process. A degenerate bootstrap interval at perfect observed accuracy would not establish zero deployment risk and is consequently not reported as such.

The additional evidence requirements have a measurable opportunity cost. Relative to confidence filtering, they rejected 65 recommendations, of which 63 were correct and two incorrect. Correct accepted yield consequently fell from 68.1% to 65.5% of all observations. Thus, evidence availability improved the observed error profile while

withholding useful diagnoses. This is the practical reason to report acceptance counts alongside conditional accuracy. Figure 2 presents threshold sensitivity and the relationship between accepted coverage and correct accepted yield. It makes visible the cases transferred to further investigation rather than silently treating abstention as successful resolution.

The cost increased as records disappeared. Evidence gated coverage was 98.0% with complete telemetry, 74.3% at 15% missingness, 54.2% at 30%, and 35.5% at 45%. At the highest missingness level, 387 of 600 observations were deferred. These outcomes cannot support a claim that the proposed workflow accelerates incident response: no responder time, workload, recovery duration, or documentation effort was measured. An organisation adopting such a policy would need to budget for the investigation queue created by rejected recommendations, especially when telemetry loss coincides with service degradation.

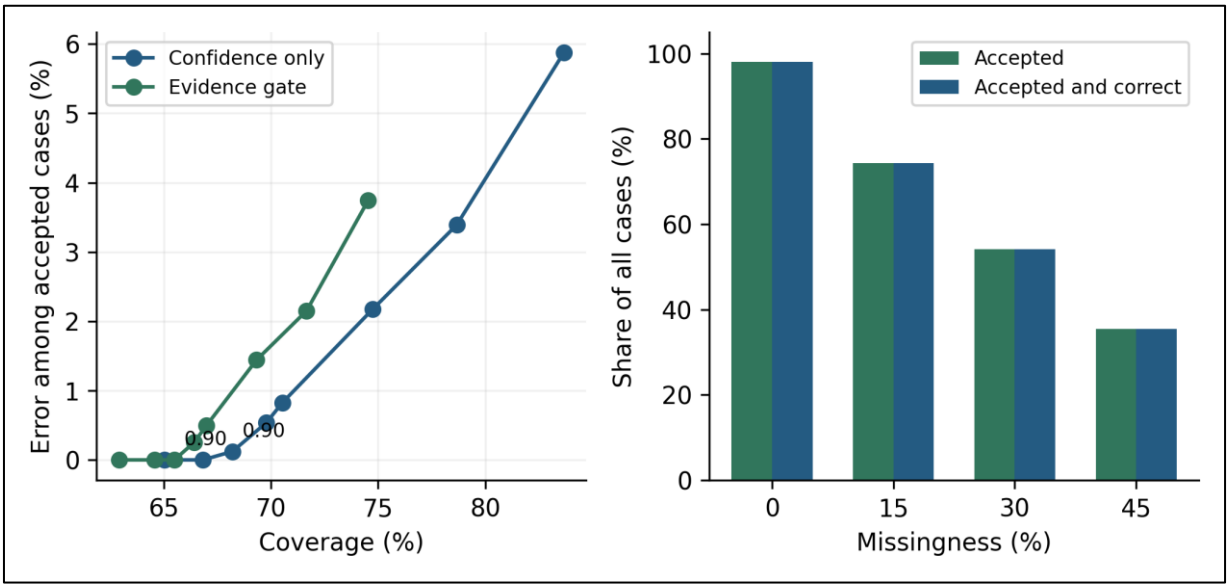


Figure 2: Left: pooled risk versus coverage for fixed threshold sensitivity, with 0.90 labelled. Right: evidence gated coverage and correct accepted yield. Their equality reflects zero observed accepted errors in the matched model conditions, not guaranteed correctness.

The mismatch experiment changes the interpretation of apparently perfect matched model performance. At 30% missingness, weakening the root signal and introducing additional onset noise reduced unrestricted accuracy from 81.7% to 70.5%. The evidence gate accepted 289 of 600 cases, with 268 correct and 21 incorrect, giving 48.2% coverage and 92.7% accepted accuracy. Valid evidence and a high model posterior therefore did not preserve the matched model error rate. This stress test is limited, but it demonstrates that cryptographic assurance cannot compensate for incorrect likelihood assumptions or unmodelled timing behaviour.

Table 3: Model mismatch at 30 percent missingness

Condition	Graph accuracy %	Gate accepted	Accepted correct	Accepted accuracy %
Matched model	81.7	325/600	325	100.0
Weakened root and noisy onset	70.5	289/600	268	92.7

Integrity testing produced a different pattern. Every clean record passed verification. All 1,000 specified violations were rejected: changed telemetry bytes, altered conclusions, altered rule identifiers, removed evidence objects, and substitution into another incident. Each category contained 200 checks. However, all 200 deliberately false conclusions passed the integrity verifier after being signed by the authorised test key. Figure 3 contrasts these outcomes. The verifier behaved correctly as an integrity mechanism; it was never a truth oracle. The deterministic test key is published solely to reproduce these checks and provides no deployment security.

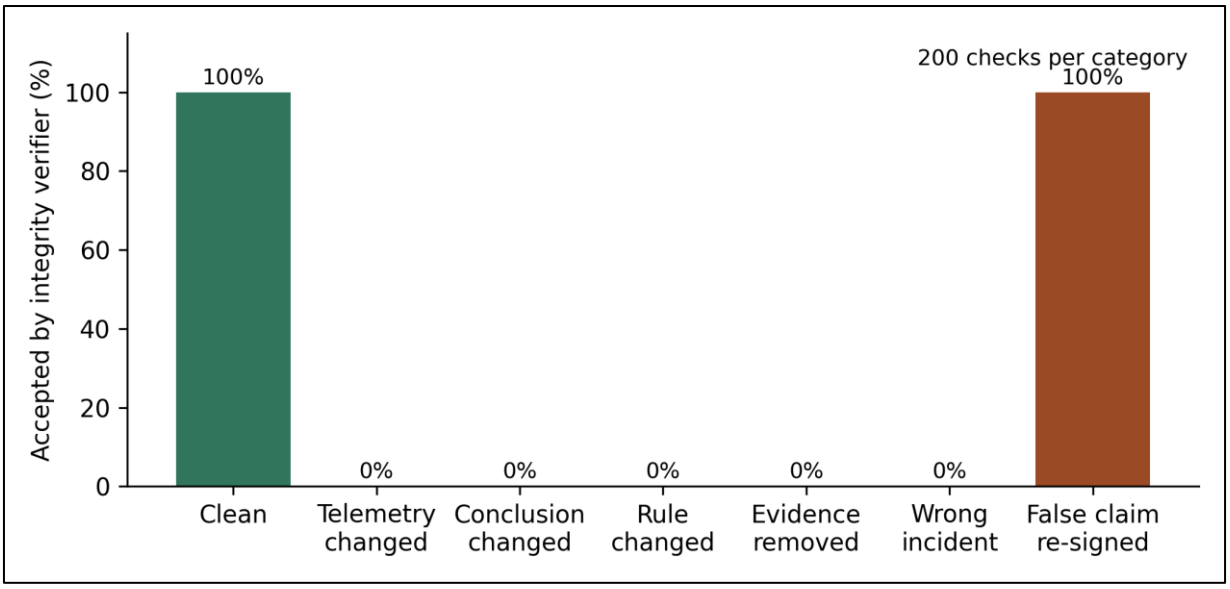


Figure 3: Integrity verifier outcomes for 200 records per category. The five violation categories produce 1,000 rejections. Re-signed false claims pass because a valid signature authenticates the committed bytes and does not establish causal truth.

All reported percentages can be recomputed from the released incident records. Reusing incident seeds across missingness conditions preserves paired comparisons, but it also introduces dependence. Resampling individual rows as independent trials would therefore misstate precision; the reported intervals instead resample complete incident clusters together.

The central finding is therefore conditional. Evidence gating makes unsupported acceptance explicit, while signatures expose specified changes to committed records. Neither mechanism independently establishes causality, human approval, or compliance. The simulation omits multiple simultaneous faults, recurrent call graphs, realistic workload traces, adversarial collectors, and key lifecycle management. Its family labels vary signal scale rather than execute different software faults. These limits define the next validation stage: benchmark fault injection, independent evidence review, and a counterbalanced responder study measuring both investigation time and deferred workload.

4 CONCLUSION

This study develops an evidence gated framework for root cause diagnosis in fintech inspired microservices and evaluates it through an executable synthetic experiment. The results show why diagnostic confidence, evidence availability, and record integrity should be measured separately. Under matched model assumptions, evidence gating eliminated observed errors among accepted recommendations while reducing coverage and withholding correct diagnoses. Under deliberate model mismatch, accepted accuracy fell substantially, demonstrating that strong evidence binding cannot repair an inaccurate diagnostic model.

The practical contribution is a decision protocol that records when automated acceptance is justified under declared assumptions and when further investigation is required. Its cryptographic component detects specified alterations and missing evidence, while deliberately false signed records reveal the boundary between integrity and truth. The study provides no empirical estimate of human response speed and makes no claim of regulatory certification.

Further research should deploy the protocol on realistic microservice benchmarks, compare established diagnostic systems, and evaluate independent reviewers and responders. Production applicability depends on calibration under distribution shift, reliable evidence retrieval, protected signing keys, and sufficient capacity to investigate deferred incidents. These conditions are part of the research problem rather than implementation details.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Data and code availability

The accompanying reproducibility package contains the generator, incident and telemetry CSV files, integrity tests, model mismatch results, figure sources, a signed example, and the supplied-source crosswalk. All measurements are synthetic. No human participants, employer systems, customer records, or production incidents were studied.

REFERENCES

[1] B. H. Sigelman et al., "Dapper, a large-scale distributed systems tracing infrastructure," Google, technical report, 2010. Available: https://research.google/pubs/dapper-a-large-scale-distributed-systems-tracing-infrastructure/

[2] W3C, "Trace Context," W3C Recommendation, Nov. 23, 2021. Available: https://www.w3.org/TR/trace-context-1/

[3] OpenTelemetry Authors, "Overview," OpenTelemetry Specification, accessed Nov. 3, 2026. Available: https://opentelemetry.io/docs/specs/otel/overview/

[4] L. Wu, J. Tordsson, E. Elmroth, and O. Kao, "MicroRCA: Root cause localization of performance issues in microservices," in Proc. IEEE/IFIP NOMS, 2020, pp. 1–9, doi: 10.1109/NOMS47738.2020.9110353.

[5] J. Soldani, S. Forti, and A. Brogi, "yRCA: An explainable failure root cause analyser," Science of Computer Programming, vol. 230, Art. no. 102997, 2023, doi: 10.1016/j.scico.2023.102997.

[6] J. Soldani, S. Forti, L. Roveroni, and A. Brogi, "Explaining microservices' cascading failures from their logs," Software: Practice and Experience, vol. 55, no. 5, pp. 809–828, 2025, doi: 10.1002/spe.3400.

[7] G. Yu et al., "MicroRank: End-to-end latency issue localization with extended spectrum analysis in microservice environments," in Proc. The Web Conference, 2021, pp. 3087–3098, doi: 10.1145/3442381.3449905.

[8] P. J. Phillips et al., "Four principles of explainable artificial intelligence," NISTIR 8312, 2021, doi: 10.6028/NIST.IR.8312.

[9] L. Moreau and P. Missier, Eds., "PROV-DM: The PROV data model," W3C Recommendation, Apr. 30, 2013. Available: https://www.w3.org/TR/prov-dm/

[10] A. Nelson, S. Rekhi, M. Souppaya, and K. Scarfone, "Incident response recommendations and considerations for cybersecurity risk management: A CSF 2.0 community profile," NIST SP 800-61 Rev. 3, 2025, doi: 10.6028/NIST.SP.800-61r3.

[11] A. Ologun, O. M. Ikeakaonwu, A. F. Ibidunmoye, G. A. Eneano, C. C. Chuwa, and L. O. Kolawole, "AI governance and ethical frameworks for public-sector AI decision systems: An institutional operationalisation model," AI and Ethics, vol. 6, Art. no. 294, 2026, doi: 10.1007/s43681-026-01143-x.

[12] E. I. Igbodor, I. C. Mordi, N. B. Umoru, S. C. Akaelu, S. O. Akaelu, and F. T. Omigbodun, "Trust calibration in human-AI collaborative decision-making: A cross-domain investigation of climate intelligence and organisational governance systems," Human-Intelligent Systems Integration, 2026, doi: 10.1007/s42454-026-00111-4.

[13] National Institute of Standards and Technology, "Secure Hash Standard," FIPS PUB 180-4, Aug. 2015, doi: 10.6028/NIST.FIPS.180-4.

[14] National Institute of Standards and Technology, "Digital Signature Standard," FIPS PUB 186-5, Feb. 2023, doi: 10.6028/NIST.FIPS.186-5.

[15] A. Rundgren, B. Jordan, and S. Erdtman, "JSON Canonicalization Scheme (JCS)," RFC 8785, Jun. 2020, doi: 10.17487/RFC8785.

[16] S. Josefsson and I. Liusvaara, "Edwards-Curve Digital Signature Algorithm (EdDSA)," RFC 8032, Jan. 2017, doi: 10.17487/RFC8032.

[17] B. Laurie, E. Messeri, and R. Stradling, "Certificate Transparency Version 2.0," RFC 9162, Dec. 2021, doi: 10.17487/RFC9162.

[18] R. El-Yaniv and Y. Wiener, “On the foundations of noise-free selective classification,” Journal of Machine Learning Research, vol. 11, pp. 1605–1641, 2010. Available: https://jmlr.org/papers/v11/el-yaniv10a.html

[19] Y. Geifman and R. El-Yaniv, “Selective classification for deep neural networks,” in Advances in Neural Information Processing Systems, vol. 30, 2017. Available: https://papers.nips.cc/paper_files/paper/2017/hash/4a8423d5e91fda00bb7e46540e2b0cf1-Abstract.html

[20] Y. Geifman and R. El-Yaniv, “SelectiveNet: A deep neural network with an integrated reject option,” in Proc. 36th Int. Conf. Machine Learning, PMLR, vol. 97, 2019, pp. 2151–2159. Available: https://proceedings.mlr.press/v97/geifman19a.html

[21] Y. Gan et al., “An open-source benchmark suite for microservices and their hardware-software implications for cloud & edge systems,” in Proc. ASPLOS, 2019, pp. 3–18, doi: 10.1145/3297858.3304013.

[22] B. Efron, “Bootstrap methods: Another look at the jackknife,” The Annals of Statistics, vol. 7, no. 1, pp. 1–26, 1979, doi: 10.1214/aos/1176344552.

[23] National Institute of Standards and Technology, “Artificial Intelligence Risk Management Framework (AI RMF 1.0),” NIST AI 100-1, Jan. 2023, doi: 10.6028/NIST.AI.100-1.

[24] A. A. Adefisan-Williams et al., “Strategic tax architecture and foreign direct investment resilience in resource-rich Nigeria,” SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7051356Supplied item 1. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[25] A. A. Adefisan-Williams, S. A. Adeniyi, O. M. Ikeakaonwu, D. O. Olokpo and E. I. Igbodor, “The impact of tertiary education tax on foreign direct investment in Nigeria: Evidence from long-run time series analysis,” International Journal of Research in Management, vol. 16, no. 4, pp. 1–16, 2026. Available: https://zenodo.org/records/21413685Supplied item 2. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[26] S. A. Adeniyi, A. A. Adefisan-Williams, R. A. Olawale, S. C. Akaelu and S. O. Akaelu, “Synthetic data augmentation for consumer choice models: Utility, privacy, and value,” Strategic Business Research, vol. 2, no. 1, Art. no. 100277, 2026. Available: https://doi.org/10.1016/j.sbr.2026.100277Supplied item 3. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation.

[27] S. A. Adeniyi, A. A. Adefisan-Williams, R. Olawale, S. C. Akaelu and S. O. Akaelu, “Tax policy predictability and foreign investment resilience in resource-rich Africa,” SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7176301Supplied item 4. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[28] S. A. Adeniyi, A. A. Adefisan-Williams, R. A. Olawale, D. O. Olokpo and E. I. Igbodor, “Digital twin-enabled predictive maintenance for climate-smart food dehydration in tropical climates,” International Journal of Research in Management Fields, vol. 16, no. 4, pp. 1–9, 2026.Supplied item 5. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation. Publication details supplied by you; publisher/DOI link unverified.

[29] E. A. Adeola et al., “Advancing urban governance through integrated BIM–DT–CIM models,” World Journal of Biology Pharmacy and Health Sciences, vol. 23, no. 3, pp. 500–508, 2025. Available: https://doi.org/10.30574/wjbphs.2025.23.3.0875Supplied item 6. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[30] E. A. Adeola et al., “AI-powered predictive control in digital twin HVAC systems,” International Journal of Research Publication and Reviews, vol. 6, no. 9, pp. 5368–5375, 2025. Available: https://ijrpr.com/uploads/V6ISSUE9/IJRPR53234.pdfSupplied item 7. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation.

[31] E. A. Adeola et al., “Integrating AI and encryption to safeguard digital assets globally,” International Journal of Innovative Science and Research Technology, vol. 10, no. 9, pp. 2337–2345, 2025. Available: https://doi.org/10.38124/ijisrt/25sep1242Supplied item 8. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[32] S. C. Akaelu et al., “Comparing green capability performance associations through a reproducible score level simulation,” Strategic Business Research, 2026.Supplied item 9. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. DOI, article number and complete authorship unverified.

[33] S. O. Akaelu, E. I. Igbodor, D. O. Olokpo, F. T. Omigbodun, A. L. Ashaye and O. L. Lawal, “AI capability, adoption, dynamic renewal and SME performance: An exploratory secondary reanalysis,” Strategic Business Research, vol. 2, no. 1, Art. no. 100297, 2026. Available: https://doi.org/10.1016/j.sbr.2026.100297Supplied item 10. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[34] S. O. Akaelu et al., "Humidity-aware agro-waste biochar–MOF adsorbents for solar-regenerated CO_2 capture: A mechanistic circular-economy design framework," Journal of Environmental Chemical Engineering, vol. 14, no. 5, Art. no. 124636, 2026. Available: https://doi.org/10.1016/j.jece.2026.124636Supplied item 11. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. DOI located in the ResearchGate record; publisher metadata should be checked before submission.

[35] S. O. Akaelu et al., "Integrating health into techno-economic assessment for solar-powered hospital water systems," International Journal of Energy and Water Resources, vol. 10, no. 2, Art. no. 85, 2026. Available: https://doi.org/10.1007/s42108-026-00508-6Supplied item 12. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[36] S. O. Akaelu et al., "The hidden health-economic costs of failing water-energy infrastructure," International Journal of Energy and Water Resources, vol. 10, no. 3, Art. no. 122, 2026. Available: https://doi.org/10.1007/s42108-026-00541-5Supplied item 13. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[37] O. O. Akinola et al., "Balancing AI efficiency and ethics for long-term business sustainability," International Journal of Research in Engineering, Science and Management, vol. 8, no. 8, pp. 61–69, 2025. Available: https://journal.ijresm.com/index.php/ijresm/article/view/3340Supplied item 14. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[38] O. O. Akinola, S. A. Palmer, N. B. Umoru and I. C. Mordi, "Extractive mechanisms in democratic media: Platform capitalism and the paradox of TikTok live streaming infrastructure," American Journal of Sustainable Cities and Society, vol. 16, no. 1, 2026. Available: https://zenodo.org/records/18806657Supplied item 15. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[39] O. O. Akinola, S. A. Palmer, N. B. Umoru and I. C. Mordi, "Regulatory architectures for autonomous AI agents: A comparative jurisprudential analysis of UK and EU frameworks," American Journal of Sustainable Cities and Society, vol. 16, no. 1, 2026. Available: https://zenodo.org/records/18806260Supplied item 16. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[40] A. L. Ashaye, O. F. Orisakahunsi, O. L. Lawal, S. A. Adeniyi, O. M. Ikeakaonwu and P. K. Ishaku, "Bias, transparency and accountability in algorithmic human resource management," Strategic Business Research, Art. no. 100308, 2026. Available: https://www.sciencedirect.com/science/article/pii/S3051064326002591Supplied item 17. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[41] A. L. Ashaye et al., "Trust-constrained dynamic pricing for fair personalisation and sustainable long-term customer value creation," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7272453Supplied item 18. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[42] A. L. Ashaye et al., "When smart prices feel unfair: Rebuilding consumer trust in algorithmic markets," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7228537Supplied item 19. Supplied record; not independently verified. Potential governance context; not RCA evidence.C. C. Chuwa, L. O. Kolawole, G. A. Eneano, O. M. Ikeakaonwu, O. B. Olasilola, A. F. Ibidunmoye and F. T. Omigbodun, "Solar photocatalysis for emerging pollutant removal in water: Field-scale irradiance–kinetics analysis," International Journal of Energy and Water Resources, 10, Art. no. 97, 2026. Available: https://doi.org/10.1007/s42108-026-00521-9Supplied item 20. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[43] I. Elemure et al., "Embedding safeguarding in integrated care for older adults," International Journal of Science and Research Archive, vol. 16, no. 3, pp. 955–963, 2025. Available: https://ijsra.net/sites/default/files/fulltext_pdf/IJSRA-2025-2655.pdfSupplied item 21. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[44] I. Elemure et al., "Integrating IoT and digital twins to transform urban governance," International Journal of Progressive Research in Science and Engineering, 2025. Available: https://journal.ijprse.com/index.php/ijprse/article/view/1228Supplied item 22. Supplied record; not independently verified. Potential governance context; not RCA evidence. The title and journal are located, but the conflicting author order in your records still requires checking.

[45] I. Elemure et al., "Life-course impact of trauma on stress biology," International Journal of Innovative Science and Research Technology, vol. 10, no. 9, 2025. Available: https://doi.org/10.38124/ijisrt/25sep910Supplied item 23. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[46] I. Elemure et al., "Resilient supply chains and sustainability for digital transformation in remote work," International Journal of Science and Research Archive, 2025.Supplied item 24. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation. DOI, volume and pagination unverified.

[47] I. Elemure, E. A. Adeola, A. G. Ologun, O. O. Odesanya, P. T. Oluwasola and O. D. Salau, "Transforming resilience with predictive digital twin technologies," World Journal of Biology Pharmacy and Health Sciences, vol. 23, no. 3, pp. 450–458, 2025. Available: https://doi.org/10.30574/wjbphs.2025.23.3.0850Supplied item 25. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation.

[48] I. E. Elemure, A. G. Ologun, L. O. Kolawole and C. C. Chuwa, "Analysis of digital twin-enabled lean-green manufacturing for sustainable industrial systems," Zenodo [Repository record], 2026. Available: https://zenodo.org/records/19206423Supplied item 26. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation.

[49] I. E. Elemure, A. G. Ologun, L. O. Kolawole and C. C. Chuwa, "Cyber-physical lean-green systems: Integrating IoT and digital twins for sustainable production," [publication venue not verified], 2026. Available: www.researchgate.net — supplied recordSupplied item 27. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation. Journal and DOI unverified.

[50] I. E. Elemure, A. G. Ologun, L. O. Kolawole and C. C. Chuwa, "Sustainable supply chain optimisation using lean-green principles: A quantitative and qualitative analysis," International Journal of Advanced Scientific and Technical Research, 2026. Available: https://doi.org/10.5281/zenodo.19206285Supplied item 28. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation.

[51] I. E. Elemure et al., "The calculus of control: Metrics, morality, and the machinery of governance in pre-algorithmic optimization systems," Research Square [Preprint], 2026. Available: https://doi.org/10.21203/rs.3.rs-9087686/v1Supplied item 29. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[52] I. E. Elemure et al., "When metrics govern: Pre-algorithmic optimisation and the ethics of artificial intelligence," Research Square [Preprint], 2026. Available: https://doi.org/10.21203/rs.3.rs-8752951/v1Supplied item 30. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[53] G. A. Eneano et al., "Advanced membrane technologies for drinking-water safety: A biomedical engineering scoping review," Sustainable Chemistry One World, Art. no. 100307, 2026. Available: https://doi.org/10.1016/j.scowo.2026.100307Supplied item 31. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[54] G. A. Eneano et al., "Feedback withdrawal and independent competence in AI-assisted laparoscopic surgical training," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7571293Supplied item 32. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[55] G. A. Eneano et al., "Integrating digital health informatics to improve mental and physical health outcomes: A cross-sectional evaluation of ICT-enabled care pathways," Human-Intelligent Systems Integration, 2026. Available: https://ouci.dntb.gov.ua/en/works/4YmrBVea/Supplied item 33. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. Publisher DOI and final pagination require confirmation.

[56] G. A. Eneano et al., "Intelligent membrane systems for low-emission nitrogen management in agricultural wastewaters," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=6137613Supplied item 34. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[57] A. A. Fajingbesi et al., "Safer, longer-lasting batteries using a smart gel electrolyte mix," Future Batteries, 9, Art. no. 100132, 2026. Available: https://doi.org/10.1016/j.fub.2025.100132Supplied item 35. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. The final issue year is 2026, although the DOI contains 2025 and the early online record is dated December 2025.

[58] A. F. Ibidunmoye et al., "The structural tension between AI optimisation and ethical governance: Empirical evidence from organisational decision-making," Research Square [Preprint], 2026. Available: https://doi.org/10.21203/rs.3.rs-8605675/v1Supplied item 36. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[59] A. F. Ibidunmoye et al., "When AI measures sustainability: Ethical risks of metrics, bias, and SDG-washing," Research Square [Preprint], 2026. Available: https://doi.org/10.21203/rs.3.rs-8564828/v1Supplied item 37. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[60] E. I. Igbodor et al., "Beyond transparency: Strategic contestability in algorithmic pricing and consumer trust," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7272449Supplied item 38. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[61] E. I. Igbodor et al., "Human-centred prescriptive on sociotechnical accountability frameworks for ethical AI-driven sustainability management in SMEs," Human-Intelligent Systems Integration, 2026.Supplied item 39.

Supplied record; not independently verified. Potential governance context; not RCA evidence. DOI and final publication details unverified.

[62] O. M. Ikeakaonwu et al., "Circular carbon capture and utilisation pathways for sustainable agricultural systems," Sustainable Chemistry One World, Art. no. 100246, 2026. Available: https://doi.org/10.1016/j.scowo.2026.100246Supplied item 41. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[63] P. K. Ishaku, H. C. Ikediashi and E. I. Igbodor, "An ethical-legal framework for AI early warning systems in trafficking prevention," Research Square [Preprint], 2026. Available: https://doi.org/10.21203/rs.3.rs-9801239/v1Supplied item 42. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[64] P. K. Ishaku, H. C. Ikediashi, I. C. C. Mordi, A. A. Adefisan-Williams and S. A. Adeniyi, "Child-rights disclosure without remedy: Strategic governance gaps in food supply chains," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7150555Supplied item 43. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[65] P. K. Ishaku, H. C. Ikediashi, I. C. Mordi, E. I. Igbodor, A. A. Adefisan-Williams and S. A. Adeniyi, "Child-safe platform marketing governance: Evidence from digital business risk pathways," Strategic Business Research, vol. 2, no. 1, Art. no. 100292, 2026. Available: https://doi.org/10.1016/j.sbr.2026.100292Supplied item 44. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[66] P. K. Ishaku et al., "Safeguarding capability as strategy: Digital whistleblowing for women's workplace safety," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7088064Supplied item 45. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[67] P. K. Ishaku et al., "Safeguarding human agency through noncompensatory evaluation of intelligent institutional systems," International Journal of Advanced Scientific and Technical Research, 2026.Supplied item 46. Supplied record; not independently verified. Potential governance context; not RCA evidence. DOI, volume, issue and pagination unverified.

[68] L. O. Kolawole et al., "Data-driven modelling of behavioural cost–carbon trade-offs for smart environmental decision support," Research Square [Preprint], 2026. Available: https://doi.org/10.21203/rs.3.rs-8866333/v1Supplied item 47. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[69] L. O. Kolawole, C. C. Chuwa, I. E. Elemure, O. M. Ikeakaonwu, A. F. Ibidunmoye, G. A. Eneano and F. T. Omigbodun, "From waste to power: Lifecycle-optimised biodegradable piezoelectric systems for sustainable energy harvesting," Sustainable Chemistry One World, 11, Art. no. 100244, 2026. Available: https://doi.org/10.1016/j.scowo.2026.100244Supplied item 48. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[70] L. O. Kolawole, F. Omigbodun, C. C. Chuwa, D. O. Olokpo and O. O. Oladapo, "Governing real-time carbon intelligence through assurance-gated decisions in sustainable supply chains," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7493999Supplied item 49. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation.

[71] L. O. Kolawole et al., "Smart solar water treatment: Sensor-informed control of solar TiO_2 photocatalysis for sustainable environmental water treatment," Sustainable Chemistry One World, 10, Art. no. 100213, 2026. Available: https://doi.org/10.1016/j.scowo.2026.100213Supplied item 50. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[72] O. L. Lawal et al., "Calibrated synthetic consumer panels for governed strategic market testing," Strategic Business Research, vol. 2, no. 1, Art. no. 100269, 2026. Available: https://doi.org/10.1016/j.sbr.2026.100269Supplied item 51. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation.

[73] O. L. Lawal et al., "Cost-efficiency and return on investment of synthetic data generation in strategic market research: A quantitative decision framework," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7126923Supplied item 52. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation. The located record was posted in July 2026; the supplied 2024 date was not supported.

[74] O. L. Lawal, O. F. Orisakahunsi, R. Olawale, E. I. Igbodor, A. A. Adefisan-Williams and S. A. Adeniyi, "Explainable supplier ranking improves risk calibration in new-product development under correlated disruptions," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7304537Supplied item 53. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[75] O. L. Lawal, P. K. Ishaku and B. Oladapo, "Governing algorithmic pricing through disclosure redress capacity and consumer trust," [publication venue not verified], n.d.Supplied item 54. Supplied record; not independently verified. Potential governance context; not RCA evidence. Year, publication venue and DOI/URL unverified.

[76] I. G. Malachi et al., "AI-augmented mental health care in Sahelian herder-farmer corridors: Ethical and scalable approaches via pastoral data trusts," SAP Social AI, 2025. Available: https://sai.southam.pub/index.php/sai/article/view/15Supplied item 55. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[77] I. C. Mordi, N. B. Umoru, S. A. Palmer, K. K. Oladapo and R. A. Olawale, "Digital sovereignty in the age of AI and sustainable transformation: A multi-layered governance framework," International Journal of Research in Management Fields, vol. 16, no. 1, 2026. Available: https://zenodo.org/records/18748275Supplied item 56. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[78] I. C. Mordi, S. A. Palmer, N. B. Umoru, K. K. Oladapo and R. A. Olawale, "Digital transformation in international arbitration: Reconfiguring legal frameworks and procedural integrity in the algorithmic era," American Journal of Sustainable Cities and Society, vol. 16, no. 1, 2026. Available: https://zenodo.org/records/18775222Supplied item 57. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation.

[79] I. C. Mordi, N. B. Umoru, S. A. Palmer, K. K. Oladapo and R. A. Olawale, "Layered sovereignty and digital governance: Comparative models of infrastructure, regulation, and AI-mediated control in the global data economy," International Journal of Advanced Scientific and Technical Research, vol. 16, no. 1, 2026. Available: https://zenodo.org/records/18748987Supplied item 58. Supplied record; not independently verified. Potential governance context; not RCA evidence. Your supplied records disagree on the volume/issue; confirm against the article PDF.

[80] O. O. Odesanya et al., "Bridging the gap: Rural-urban disparities in healthcare access," International Journal of Research in Management, vol. 15, no. 5, pp. 58–61, 2025. Available: https://doi.org/10.5281/zenodo.17723243 Supplied item 59. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. The repository's author field conflicts with the article record; full author order needs confirmation.

[81] [82] O. O. Odesanya et al., "Dual-triggered herbicide delivery for sustainable Sahelian agriculture," International Journal of Advance Research Publication and Reviews, vol. 2, no. 11, pp. 202–212, 2025. Available: https://ijarpr.com/uploads/V2ISSUE11/IJARPR1129.pdf

[82] Supplied item 60. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[83] O. O. Odesanya et al., "Mechanisms and equity in tobacco control: Global policy pathways," International Journal of Research Publication and Reviews, vol. 6, no. 11, pp. 2543–2553, 2025. Available: https://doi.org/10.55248/gengpi.06.1125.3894Supplied item 61. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[84] O. B. Olasilola et al., "Smart magnesium batteries: Using AI to power greener and more reliable desalination systems," Future Batteries, 2026. Available: https://www.sciencedirect.com/science/article/pii/S2950264026000122Supplied item 62. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. First-author order follows your supplied article record and requires confirmation against the publisher PDF.

[85] R. A. Olawale, O. O. Odesanya, P. T. Oluwasola, O. O. Akinola, E. A. Adeola, A. G. Ologun and I. Elemure, "AI-driven regenerative agriculture of socioecological framework for biodiversity, climate resilience, and soil health," IOSR Journal of Business and Management, vol. 27, no. 8, pp. 39–48, 2025. Available: https://doi.org/10.9790/487X-2708083948Supplied item 63. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[86] A. G. Ologun et al., "AI-driven integrated solar-agrivoltaics systems transforming food security in West Africa," International Journal of Research in Management Fields, 2025.Supplied item 64. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. The supplied volume/issue and publisher DOI/URL remain unverified.

[87] A. G. Ologun et al., "Evaluating digital health tools in chronic disease management effectiveness," International Journal of Advanced Scientific and Technical Research, vol. 15, no. 6, 2025.Supplied item 65. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. DOI and article-specific URL unverified.

[88] A. G. Ologun et al., "Integrating one health, behavioural dynamics, and surveillance to control emerging infectious disease threats," International Journal of Research in Management, vol. 15, no. 6, 2025.Supplied item 66. Supplied

record; not independently verified. Outside the direct diagnosis and evidence question. DOI and article-specific URL unverified.

[89] A. G. Ologun et al., "Optimising project portfolios through responsible AI and ethical compliance," International Journal of Research in Management Fields, 2025. Available: https://doi.org/10.5281/zenodo.18021350Supplied item 67. Supplied record; not independently verified. Potential governance context; not RCA evidence. The located record places Ologun first; your supplied lists also contain a conflicting Mordi-first version.

[90] A. Ologun, O. M. Ikeakaonwu, A. F. Ibidunmoye, G. A. Eneano, C. C. Chuwa and L. O. Kolawole, "Ethical frameworks for AI-enabled decision analytics in digital governance: A multi-stakeholder perspective," Research Square [Preprint], 2026. Available: https://doi.org/10.21203/rs.3.rs-9066551/v1Supplied item 69. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[91] A. G. Ologun, O. O. Odesanya, I. C. Mordi, N. B. Umoru and S. A. Palmer, "Resilient and sustainable digital supply chains: An integrated framework leveraging AI, IoT, and digital twin technologies," International Journal of Advanced Scientific and Technical Research, vol. 16, no. 2, 2026. Available: https://doi.org/10.5281/zenodo.18899032Supplied item 70. Supplied record; not independently verified. Adjacent systems or methods; not RCA validation.

[92] D. O. Olokpo et al., "Comparative environmental assessment of magnesium-ion and lithium-ion batteries using artificial intelligence," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=6779039Supplied item 71. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. The SSRN metadata repeats an author name, so the complete author list requires checking.

[93] D. O. Olokpo et al., "Fairness signals, consumer agency, and trust in algorithmic pricing ecosystems," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7272454Supplied item 72. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[94] D. O. Olokpo et al., "Machine learning-based groundwater contamination risk prediction from lithium-ion battery waste," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=6779040Supplied item 73. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[95] D. O. Olokpo et al., "Renewable electricity as a design metric for profitable sustainable chemistry," Sustainable Chemistry One World, 2026. Supplied item 74. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. Publisher DOI, article number and complete authorship unverified.

[96] A. A. Oni, A. A. Fajingbesi, E. O. Oluwabiyi, F. T. Omigbodun, V. M. Jegede, A. G. Ologun and F. P. Adeyekun, "Eco-friendly innovation: Enhancing orthotic production with additive manufacturing," Process Safety and Environmental Protection, 210, Art. no. 108665, 2026. Available: https://doi.org/10.1016/j.psep.2026.108665Supplied item 75. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[97] O. D. Oni et al., "Converting AI governance commitments into public value through timely institutional redress," American Journal of Sustainable Cities and Society, 2026.Supplied item 76. Supplied record; not independently verified. Potential governance context; not RCA evidence. DOI, volume, issue and pagination unverified.

[98] O. F. Orisakahunsi, O. L. Lawal, F. T. Omigbodun, E. I. Igbodor, A. A. Adefisan-Williams and P. K. Ishaku, "Bridging the trust gap: Assuring predictive validity and trustworthiness in AI-generated consumer behaviour insights," Strategic Business Research, Art. no. 100291, 2026. Available: https://doi.org/10.1016/j.sbr.2026.100291Supplied item 77. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[99] O. F. Orisakahunsi et al., "Fairness-constrained dynamic pricing strategically balances profit, equity and consumer trust risk," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7272455Supplied item 78. Supplied record; not independently verified. Potential governance context; not RCA evidence. The located SSRN record places Orisakahunsi first, rather than Lawal.

[100] O. F. Orisakahunsi, O. L. Lawal, F. T. Omigbodun, E. I. Igbodor, A. A. Adefisan-Williams and P. K. Ishaku, "Interoperable token liquidity and consumer retention across blockchain loyalty ecosystems," Strategic Business Research, vol. 2, no. 1, Art. no. 100283, 2026. Available: https://doi.org/10.1016/j.sbr.2026.100283Supplied item 79. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[101] S. A. Palmer, N. B. Umoru, I. C. Mordi and R. A. Olawale, "Integrated ethical framework for digital transformation: Balancing AI governance, supply chain resilience, and sustainable infrastructure," American Journal of Sustainable Cities and Society, vol. 16, no. 1, 2026. Available: https://doi.org/10.5281/zenodo.18788416Supplied item 80. Supplied record; not independently verified. Potential governance context; not RCA evidence.

[102] S. A. Palmer, N. B. Umoru, I. C. Mordi, O. M. Ikeakaonwu and A. F. Ibidunmoye, "Leadership dynamics and organisational culture in resource-constrained healthcare: A mixed-methods analysis of frontline management effectiveness," International Journal of Research in Management, vol. 16, no. 2, pp. 1–14, 2026.Supplied item 81. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. DOI/URL unverified.

[103] S. A. Palmer, N. B. Umoru, I. C. Mordi, O. M. Ikeakaonwu and A. F. Ibidunmoye, "Leadership dynamics and staff performance in resource-constrained healthcare settings: A sequential explanatory mixed-methods investigation," International Journal of Advanced Scientific and Technical Research, vol. 16, no. 2, 2026.Supplied item 82. Supplied record; not independently verified. Outside the direct diagnosis and evidence question. DOI/URL unverified.

[104] C. D. Ukala et al., "AI-enabled earth observation as a strategic capability for climate-resilient infrastructure management," SSRN [Preprint], 2026. Available: https://ssrn.com/abstract=7467825Supplied item 83. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[105] N. B. Umoru et al., "AI-mediated learning environments, pedagogical uncertainty, and the ethics of belonging," Research Square [Preprint], 2026. Available: https://doi.org/10.21203/rs.3.rs-8688758/v1Supplied item 84. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[106] N. B. Umoru, S. A. Adeniyi, A. A. Adefisan-Williams, R. A. Olawale and E. I. Igbodor, "From compliance to self-advocacy: Neurodiversity-affirming SEL for ADHD and autistic students," International Journal of Advanced Scientific and Technical Research, vol. 16, no. 4, 2026. Available: https://zenodo.org/records/21455037Supplied item 85. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[107] N. B. Umoru, S. A. Adeniyi, A. A. Adefisan-Williams, R. A. Olawale and E. I. Igbodor, "How trauma-informed pedagogy works: Parallel social-emotional mediation of adolescent academic behavioural outcomes," American Journal of Sustainable Cities and Society, vol. 16, no. 4, 2026. Available: https://doi.org/10.5281/zenodo.21496086Supplied item 86. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[108] N. B. Umoru, K. E. Umoru, P. K. Ishaku, O. L. Lawal and A. A. Adefisan-Williams, "Scaling artificial intelligence: Diffusion speed and enterprise-size polarisation across Europe," Strategic Business Research, Art. no. 100318, 2026. Available: https://www.sciencedirect.com/science/article/pii/S3051064326002694Supplied item 87. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[109] N. B. Umoru, S. A. Adeniyi, A. A. Adefisan-Williams and R. A. Olawale, "Social-emotional learning, mentoring quality, and persistence: A multi-institutional empirical study," International Journal of Research in Management Fields, vol. 16, no. 4, 2026. Available: https://zenodo.org/records/21495771Supplied item 88. Supplied record; not independently verified. Outside the direct diagnosis and evidence question.

[110] N. B. Umoru, S. A. Adeniyi, A. A. Adefisan-Williams and R. A. Olawale, "Teacher emotional labor, burnout, and SEL fidelity: Pathways to student behavioral outcomes," International Journal of Advanced Scientific and Technical Research, vol. 16, no. 4, 2026. Available: https://zenodo.org/records/21495287

AUTHOR REVIEW APPENDIX

This appendix is an editorial audit and should be resolved before journal submission. The collection contains 110 unique bibliographic records: 23 cited sources and 87 additional supplied records. All 89 attached entries are represented; supplied items 40 and 68 are already cited in the main bibliography. The remaining entries are preserved below rather than being used as unsupported or irrelevant citations. This is not a claim that the manuscript contains 110 verified research references.

The source brief did not identify a target journal. General IEEE referencing was selected for this draft; no journal-specific fit or acceptance is asserted. The 89 supplied records were screened by their supplied titles and metadata. Two relevant records were checked against publisher pages and used for limited conceptual claims. Other entries require article-level verification and relevance assessment before inclusion in a submission bibliography.

Table A1: Requested structure and delivered prose word counts

Component	Words	Requested
Title	11	10–12
Abstract	178	150–190
Introduction	650	650

Methodology	368	350–450
Empirical results	750	750
Conclusion	190	170–200

Counts exclude headings, citation markers, equations, tables, captions, references, and this appendix. The paper includes five keywords, three figures, and three main tables.

Assessment of the supplied research brief

The brief reports 50 trials and a 66.3% time reduction but supplies neither the claimed CSV nor event logs, investigator records, or an executable experiment producing those values. Those claims were not carried into the manuscript.

The brief describes 25 baseline trials with binary accuracy of 78%; that percentage is not an integer number of correct diagnoses out of 25. The supplied means and standard deviations cannot be authenticated from the available material.

Reproducing the supplied ranking arithmetic for a ledger failure gives the API gateway a score of 0.5882 and the ledger 0.1765. The caller-to-dependency graph is interpreted in the wrong direction for its originating-fault rule. The new model uses explicit reverse reachability.

The supplied signature is a text placeholder built from a digest and a literal string, not an asymmetric signature. The new study signs and verifies actual Ed25519 messages using an openly disclosed simulation-only fixture key.

The supplied generated payload differs from its own schema in required field names, environment values, and telemetry types. The new signed manifest explicitly describes its restricted scope and records that no human review occurred.

A preserved evidence object does not establish truthful collection, independent approval, append-only retention, trusted time, or compliance. The proposed method implements incident binding and integrity tests; it does not implement a full regulatory assurance system.

Use of the supplied literature

The supplied corpus spans AI governance, business strategy, digital twins, health, education, agriculture, water treatment, and batteries. Its strongest conceptual connection is the need for accountable decisions and calibrated reliance. Much of it has no direct evidential role in microservice root cause localisation. The entries below therefore document inclusion decisions for the entire corpus rather than pad the paper with claims the sources cannot support.

Supplied item 40 corresponds to reference [12]; supplied item 68 corresponds to reference [11]. Both are preserved in the machine-readable crosswalk. For item 68, the publisher abstract describes survey and interview data while the data-availability statement says no datasets were generated or analysed. This discrepancy is flagged for author review, and no numerical findings from that source are used.