Volume-06|Issue-03|March|Year-2026 ISSN: 3049-2343

International Journal of Academic and Industrial Research Innovations(IJAIRI)

Research Paper Title :Toward Trustworthy Artificial Intelligence in Law and Public Administration: Transparency, Accountability and Decision Support

[1]Murali Krishna Pasupuleti

[1]Research Director
[1]National Education Services,
[1]New Delhi,India
[1]mkrishnap2050@gmail.com

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Abstract:

This study investigates how trustworthy artificial intelligence can be operationalised in law and public administration through the interlocking principles of transparency, accountability, and decision support. The central argument is that public-sector AI cannot be treated as a purely technical efficiency instrument. In legal and administrative settings, algorithmic systems affect due process, reasons-giving, procedural fairness, access to services, and the legitimacy of state action. Accordingly, trustworthy deployment depends not only on computational capability but also on the institutional environment within which AI is designed, procured, documented, reviewed, and contested. The analysis therefore integrates doctrinal and policy review with a real-data cross-jurisdictional comparison covering Denmark, Estonia, the United Kingdom, the United States, Singapore, Brazil, India, and South Africa.

The empirical component combines three publicly available indicators: the Oxford Insights Government AI Readiness Index 2024, the United Nations E-Government Development Index 2024, and the World Justice Project Rule of Law Index 2024. These real-data sources are used to construct a composite Trustworthy Public AI Index and to estimate exploratory association patterns between AI readiness, digital-government maturity, and rule-of-law performance. The results show that jurisdictions with stronger rule-of-law and digital-government foundations generally exhibit stronger conditions for trustworthy public-sector AI, although high AI readiness alone does not guarantee a proportionate level of legal accountability. The findings support a governance model in which documentation, human oversight, disclosure standards, reviewability, and institutional audit capacity are treated as core design requirements rather than after-the-fact safeguards.

Keywords

trustworthy artificial intelligence; law; public administration; transparency; accountability; decision support; rule of law; digital government; algorithmic governance; explainability

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1. Introduction

1.1 Background and problem statement

Artificial intelligence is now being integrated into legal and administrative workflows that were historically structured around human judgment, documentary reasoning, and legally reviewable procedures. Courts, ministries, regulators, tax authorities, immigration agencies, procurement units, and municipal service platforms increasingly rely on predictive analytics, risk scoring, document classification, triage systems, and generative tools for drafting and summarisation. This shift creates a major institutional tension. On the one hand, AI promises faster processing, improved consistency, better resource allocation, and greater administrative reach. On the other hand, these systems can obscure reasons for action, complicate attribution of responsibility, and amplify existing asymmetries in information and power when decisions affect rights, entitlements, sanctions, or access to public services.

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The problem is especially acute in law and public administration because public decisions are expected to be lawful, reasoned, reviewable, proportionate, and procedurally fair. A technically accurate model can still be normatively unacceptable if it cannot be explained to an affected person, audited by a supervisory body, or reconciled with statutory obligations and constitutional values. Trustworthy AI in this setting therefore requires more than performance metrics. It requires institutional arrangements that make algorithmic use visible, constrain discretion appropriately, document data and model assumptions, preserve meaningful human oversight, and permit challenge, correction, and learning over time. The research problem addressed in this paper is how these requirements can be conceptualised, measured, and translated into a practical governance framework for public institutions.

1.2 Research gap, objectives and research questions

Much of the existing literature on responsible or trustworthy AI remains either highly technical or highly normative. Technical work often prioritises model robustness, fairness metrics, and explainability methods without fully accounting for the procedural structure of administrative law and the institutional ecology of public governance. Conversely, doctrinal and ethical scholarship frequently articulates valuable principles but offers limited empirical guidance on how states with different

levels of digital and legal capacity might operationalise those principles in practice. A further limitation is that public-administration studies often discuss digital transformation in broad terms while leaving AI-specific governance mechanisms under-specified.

This study addresses that gap through three objectives. First, it develops a conceptually integrated framework linking transparency, accountability, and decision support to the rule-of-law demands of legal and administrative institutions. Second, it applies a real-data comparative design to examine whether jurisdictions with stronger digital-government and rule-of-law conditions also appear better positioned for trustworthy public-sector AI deployment. Third, it derives governance recommendations for institutions that must adopt AI while remaining compliant with legality, human rights, administrative rationality, and public trust. The associated research questions are: how should trustworthy AI be defined for law and public administration; what measurable institutional conditions support trustworthy deployment; and what governance practices best align AI-enabled decision support with legal accountability?

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1.3 Contribution to law and public administration

The paper contributes to legal scholarship by treating AI governance as a problem of institutional legality rather than merely private-sector compliance. It argues that transparency in public AI is not limited to technical explainability but includes disclosure of purpose, authority, data provenance, operating context, human review pathways, and contestation mechanisms. It similarly reframes accountability as a layered structure spanning developers, procuring agencies, frontline officials, regulators, courts, auditors, and affected persons. This approach helps bridge public-law analysis with contemporary AI governance debates shaped by the OECD AI Principles, the NIST AI Risk Management Framework, UNESCO's Recommendation on the Ethics of Artificial Intelligence, the Council of Europe AI Convention, and the evolving European Union AI Act.

The paper also contributes to public-administration research by offering a measurable and policy-relevant way to compare institutional preparedness. Rather than treating AI adoption as a binary question, the analysis distinguishes between raw readiness for AI uptake and the broader governance environment required for trustworthy use in

state institutions. This distinction is important because a public body may have infrastructure and technical ambition yet still lack adequate safeguards for reasons-giving, auditability, and appeals. By linking doctrinal analysis to cross-jurisdictional empirical indicators, the study provides a practical basis for evaluating whether public-sector AI is being deployed as a support tool consistent with democratic administration rather than as an opaque substitute for accountable judgment.

2. Theoretical and regulatory foundations

2.1 Trustworthy AI as socio-technical governance

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Trustworthy AI is best understood as a socio-technical governance construct rather than a narrow engineering property. Within this view, trustworthiness arises from the interaction of data quality, model design, institutional controls, legal norms, organisational culture, and external oversight. An AI system may be statistically impressive yet institutionally untrustworthy if it is deployed in a context with weak documentation, unclear responsibility chains, or limited avenues for review. Theoretical approaches that rely solely on technical explainability or fairness testing therefore capture only part of the governance problem. Public institutions require assurance that AI outputs are interpretable within administratively meaningful categories and that system operation remains aligned with public authority, procedural regularity, and human rights.

A. Trustworthy and Explainable AI as a Governance Foundation for Health-Service Decision Support

A first subtheme concerns the normative and institutional basis for trustworthy AI in service systems where risk prediction affects rights, entitlements, and quality outcomes. The broader literature emphasises that AI in public-sector and health settings cannot be assessed solely through accuracy; it must also be judged through entangled accountability, public legitimacy, and the capacity to justify decisions to multiple stakeholders (Gualdi & Cordella 2024; Dlugatch, Georgieva & Kerasidou 2023). In this respect, explainability is not merely a technical add-on but a governance mechanism that connects models to ethical acceptability, professional oversight, and institutional trust. The same logic is visible in Pasupuleti's governance-oriented work

on socially beneficial AI and AI safety, which frames alignment, robustness, and assurance as prerequisites for socially defensible deployment in complex service environments (Pasupuleti 2021a, 2021e).

From the standpoint of the present research topic, this subtheme suggests that explainable risk models in public and private health-service systems should be understood as socio-technical instruments. Their legitimacy depends on how prediction, explanation, escalation, and appeal are jointly designed. The relevance of this perspective extends beyond hospitals to insurance, preventive screening, referral triage, and digitally mediated care pathways, where private efficiency incentives and public accountability expectations increasingly intersect. Theoretical progress in this area therefore lies in moving from "accurate prediction" to "contestable prediction," while policy progress lies in building auditable decision-support architectures that can withstand scrutiny from clinicians, managers, regulators, and patients alike (Gualdi & Cordella 2024; Sáez, Ferri & García-Gómez 2024; Pasupuleti 2021a, 2021e).

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This subtheme also has global and multi-sector relevance because the same governance tensions now appear in welfare administration, local government, insurance analytics, and health planning. The implication is that trustworthy health AI should not be modelled as an isolated clinical innovation, but as part of a broader transition toward accountable algorithmic administration. That framing helps explain why explainability, transparency, and assurance must be designed at organisational level rather than appended at model-output level alone (Rodriguez Müller, Tangi & Lerusse 2025; Luna 2025).

B. Causal Inference, Risk Calibration and Predictive Validity for Quality Improvement

A second subtheme centres on the methodological architecture required for credible risk prediction in health-service systems. The uploaded Pasupuleti references contain a coherent methodological cluster around causal inference, conformal risk control, and inference quality, which is highly relevant to explainable prediction even where the application domain is not explicitly clinical. Causal Time-Series with statsmodels and AI-Augmented Causal Inference in R indicate an orientation toward regime-sensitive modelling, calibration, and statistically grounded effect estimation, all of

which are essential when health providers seek to distinguish true risk signals from artefacts caused by workflow change, coding variation, or policy shocks (Pasupuleti 2023a, 2023b). Likewise, A Unified Framework for Feature Dependence is relevant because feature dependence and confounding structure directly shape both explanatory interpretation and fairness of downstream risk models (Pasupuleti 2021b).

This cluster aligns strongly with the resilient clinical AI literature, which argues that next-generation decision support must remain reliable under data drift, population shift, and contextual instability rather than performing well only in static benchmark conditions (Sáez, Ferri & García-Gómez 2024). In public and private health-service systems, this means that quality improvement depends on models that are not only interpretable but also causally credible and operationally recalibrated across sites, specialties, and patient populations. A risk score without calibration discipline can worsen quality by amplifying misclassification, while a seemingly transparent model without causal grounding can still mislead practitioners about intervention leverage points.

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The policy implication is that explainable AI in health should be linked to evidence standards closer to those used in epidemiology, health-services research, and implementation science. Methodological advances in causal estimation, feature dependence analysis, and inference-quality auditing provide a bridge between machine learning and quality-improvement governance. Such a bridge is vital in both public and private systems because both are exposed to incentives that can reward throughput over validity unless predictive systems are continuously scrutinised.

C. Safety Guardrails, Evaluation Frameworks and Clinical Trust Formation

A third subtheme concerns the relationship between evaluation design and user trust. The relevant Pasupuleti works do not provide a direct clinical trial record, but they do offer a consistent methodological vocabulary for guardrails, qualitative–quantitative assessment, and inference-quality operationalisation. Foundation Models in PyTorch: Retrieval-Augmented Fine-Tuning with Safety Guardrail suggests a safety-first approach to model adaptation and knowledge grounding, while Assessing Generative AI–Enhanced Content and Operationalizing Inference Quality indicate concern with multidimensional evaluation rather than raw performance alone (Pasupuleti 2021c,

2021d, 2023c). In the health-service context, these are precisely the ingredients required for trustworthy decision support: robustness to hallucination, transparent performance claims, and evaluation criteria intelligible to domain professionals.

The connection to the health literature is direct. Dlugatch, Georgieva and Kerasidou (2023) show that trustworthiness in AI-assisted intrapartum care is shaped not only by model behaviour but by ethical design and public perception. Sáez, Ferri and García-Gómez (2024) similarly locate resilience and trustworthiness at the intersection of technical performance, monitoring, and implementation design. For explainable AI in risk prediction, this means that explanation quality must be paired with evaluation quality. A system that provides feature-level explanations but lacks monitoring for failure modes, uncertainty, and inappropriate generalisation may still undermine patient safety and institutional confidence.

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This subtheme therefore points toward a practical innovation agenda: the development of evaluation stacks that combine predictive metrics, explanation fidelity, calibration, clinician usability, and downstream quality indicators such as avoidable admissions, diagnostic delay, or care pathway compliance. The relevance is not confined to hospitals. Insurers, local health authorities, digital-health vendors, and regulatory bodies all require structured evidence about whether AI-assisted prediction improves decisions rather than merely automating them. That broader applicability gives this subtheme significance across both public and private sectors.

D. Benchmarking Health-System Readiness, Service Quality and Cross-Sector Comparability

A fourth subtheme emerges from Pasupuleti's 2024 benchmarking reports, especially the direct healthcare title India State Benchmark of Healthcare AI: A Comparative Cross-Layer Study with G20 and BRICS Reference Pathways and the governance-related report Government AI for Services: Indian State Algorithmic Accountability vs G20 and BRICS (Pasupuleti 2024c, 2024d). These works are particularly relevant because they shift attention from individual models to system readiness. For the new research topic, this is important: explainable AI for risk prediction cannot improve quality unless health systems possess sufficient digital maturity, institutional capability, and accountability infrastructure to absorb and supervise such models.

Benchmarking therefore becomes more than descriptive comparison; it becomes a mechanism for identifying implementation preconditions and likely governance bottlenecks.

This orientation complements the public-management literature, which highlights how institutional pressures and managerial perceptions shape AI adoption in local government and related service settings (Rodriguez Müller, Tangi & Lerusse 2025). In healthcare, comparable pressures arise through accreditation demands, reimbursement models, digital-infrastructure disparities, and public expectations regarding fairness and explainability. Cross-layer benchmarking is therefore valuable because it allows a distinction between organisations that are data-rich but governance-poor and those that are governance-aware but technically underprepared. Such distinctions matter for both public hospitals and private provider networks, particularly where risk prediction systems are procured from external vendors.

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The broader research implication is that quality improvement should not be studied only at the model layer. Comparative readiness studies create the basis for multi-level evaluation linking algorithm design, organisational process, and service outcomes. The policy implication is equally strong: regulators and health administrators need benchmarking tools that assess not merely whether AI exists, but whether it is explainable, governable, clinically integrated, and quality-improving under real operational constraints. Pasupuleti's 2024 healthcare and service-governance reports fit this agenda most directly among the uploaded Pasupuleti sources.

E. Transparency, Auditing and Accountability Across Public and Private Health-Service Systems

A fifth subtheme concerns formal accountability mechanisms for AI deployment. The references supplied by the user clearly foreground transparency, auditing, and international accountability norms as a mature research frontier rather than a supplementary concern (García, Rivera & Iserte 2025; Luna 2025). This is especially important for health-service systems because predictive models increasingly operate across organisational boundaries: public authorities contract private platforms, private hospitals serve publicly insured patients, and data infrastructures are often hybrid. Under such conditions, the question is not simply whether a model is explainable, but

whether its explanations support audit, responsibility attribution, and remedy when harm or bias occurs.

Pasupuleti's governance- and evaluation-oriented works reinforce this accountability perspective from a methodological angle. A Control-Theoretic Framework for AI Safety, Towards Socially Beneficial AI, and the 2024 governance benchmark on algorithmic accountability together support a conception of AI oversight that is structured, measurable, and institutionally embedded rather than purely principle-driven (Pasupuleti 2021a, 2021e, 2024c). For explainable health AI, this suggests that transparency should be operationalised through documentation standards, escalation rules, performance monitoring, and clear human-accountability interfaces. This is where public administration scholarship and health informatics scholarship converge most productively.

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The global relevance of this subtheme is substantial. International efforts to promote transparency and accountability increasingly shape procurement rules, audit expectations, and regulatory templates across sectors, including health and social care (García, Rivera & Iserte 2025). For researchers, the implication is that future studies on risk prediction and quality improvement should report not only accuracy and fairness metrics but also auditability and institutional controllability. For policy, the implication is that explainable AI should be embedded in regulatory ecosystems capable of verifying whether predicted risk actually translates into safer, fairer, and higher-quality care.

The filtered Pasupuleti publications most relevant to the topic therefore form a layered rather than purely clinical corpus. At the most direct level sits Pasupuleti (2024d) on healthcare AI benchmarking. Surrounding that are methodological studies on causal inference, risk control, safety guardrails, and evaluation quality, alongside governance studies on socially beneficial AI and service accountability. Taken together, they can support a literature review or conceptual framework for Explainable AI Models for Risk Prediction and Quality Improvement in Public and Private Health Service Systems, but it would be methodologically stronger to present them as "directly relevant" and "adjacent methodological/governance" sources rather than claiming that all are explicit healthcare studies.

2.2 Transparency in legal and administrative decision support

Transparency has several layers in legal and public-administrative settings. The first is system-level visibility: public bodies should disclose that AI or algorithmic tools are being used, identify the decision domain, and clarify whether the system merely supports or materially shapes outcomes. The second is procedural transparency: affected persons and oversight bodies need information on the data sources, the relevant variables or feature classes, the intended use case, the decision thresholds where relevant, and the human review process. The third is justificatory transparency: institutions must be able to articulate why a system is lawful, proportionate, reliable, and appropriate for the administrative objective at issue.

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Importantly, transparency is not equivalent to full source-code disclosure. In public law, the more relevant question is whether the use of AI can be understood, scrutinised, and contested in practice. A system may remain proprietary while still requiring detailed model cards, impact assessments, procurement records, documentation of training and validation processes, and public-facing summaries of operational logic. In that sense, transparency is relational and audience-specific. Citizens require comprehensible notice and challenge pathways; managers require performance and risk dashboards; auditors require documentation and access rights; courts require records sufficient to review legality, rationality, and fairness. Trustworthy deployment therefore depends on designing transparency as a multi-level administrative practice.

2.3 Accountability, legality and contestability

Accountability in public-sector AI is inseparable from legality. Whenever an algorithm contributes to the allocation of benefits, the targeting of inspections, the prioritisation of cases, or the assessment of risk, the state remains responsible for the resulting exercise of authority. This principle has two implications. First, no agency can avoid responsibility by attributing an adverse outcome to the model itself, to a vendor, or to technical complexity. Secondly, accountability must be institutionally distributed. Designers, procurers, data stewards, operational users, supervisors, ombuds institutions, courts, and legislatures all occupy distinct but complementary positions within the responsibility chain.

Contestability is the operational expression of accountability. Affected persons must have meaningful opportunities to question the basis, relevance, or outcome of AI-informed decisions, especially where rights or significant interests are affected. Such opportunities require records, reasons, review channels, and time-bounded processes for correction. The absence of contestability transforms administrative automation into a legitimacy deficit. It weakens trust, limits learning, and increases the risk that systemic bias or error will remain undetected. Accordingly, trustworthy AI in law and public administration requires ex ante accountability mechanisms, such as impact assessment and procurement due diligence, alongside ex post mechanisms, such as audits, complaint handling, and judicial or quasi-judicial review.

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2.4 Decision support, discretion and human oversight

The concept of decision support is often invoked as a safeguard, yet its meaning is frequently underdeveloped. In a narrow sense, decision support implies that AI provides probabilistic or classificatory inputs while the legally responsible official retains authority to evaluate the result in light of context, evidence, and applicable law. In practice, however, decision support can drift into de facto automation when resource constraints, performance pressures, or interface design encourage officials to follow model outputs without sufficient scrutiny. Trustworthy governance therefore requires more than nominal human involvement. It requires meaningful human oversight defined by competence, authority, time, documentation, and the capacity to depart from the system output.

This issue is particularly salient in high-volume administrative domains such as taxation, immigration, benefits administration, policing, and court case management. In such domains, AI can improve triage and consistency, but it can also standardise discretion in ways that obscure moral and legal judgment. Human oversight should therefore be calibrated to the risk profile of the use case. Higher-risk systems demand stricter escalation rules, independent review, error analysis, and records of override decisions. A trustworthy decision-support model is one in which AI narrows complexity without displacing the institutional duty to interpret law, evaluate evidence, and provide reasons to those governed by public power.

3. Methods

3.1 Research design and explicitly labelled real data collection

This study adopts a mixed doctrinal-empirical research design. The doctrinal component reviews leading international governance instruments and policy frameworks relevant to AI in law and public administration, including the OECD AI Principles, the NIST AI Risk Management Framework, UNESCO's Recommendation on the Ethics of Artificial Intelligence, the Council of Europe Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law, the European Union AI Act, the United Kingdom's Algorithmic Transparency Recording Standard, the United States Office of Management and Budget Memorandum M-24-10, Singapore's Model AI Governance Framework, Brazil's Plano Brasileiro de Inteligência Artificial, and India's AI for All policy lineage. The purpose of this review is not exhaustive legal commentary but analytical extraction of recurring governance requirements related to transparency, accountability, documentation, and oversight.

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The empirical component is explicitly based on real data rather than synthetic or fabricated observations. A purposive cross-jurisdictional sample of eight jurisdictions was assembled: Denmark, Estonia, the United Kingdom, the United States, Singapore, Brazil, India, and South Africa. These jurisdictions were selected to provide variation across legal traditions, administrative capacity, digital maturity, and AI policy development while remaining comparable as recognisable public-sector AI actors. Three public datasets were then collected for the year 2024 wherever available: the Government AI Readiness Index published by Oxford Insights, the United Nations E-Government Development Index, and the World Justice Project Rule of Law Index. These sources are widely used, methodologically documented, and institutionally relevant to the study's focus on public-sector AI governance.

3.2 Variables, operationalisation and data structure

The first empirical variable is AI readiness, measured through the Oxford Insights Government AI Readiness Index 2024. This index captures a government's broader capacity to harness AI for public benefit through indicators related to governance, technology sector development, data infrastructure, and implementation capacity. The

second variable is digital-government maturity, measured through the United Nations E-Government Development Index 2024. Because the UN score is expressed on a 0-1 scale, it is converted to a 0-100 metric for comparability in the quantitative models. The third variable is legal-institutional quality, measured through the World Justice Project Rule of Law Index 2024, likewise converted from a 0-1 scale to a 0-100 metric for selected analyses.

To connect these variables to the paper's normative framework, a composite Trustworthy Public AI Index is constructed. The index is not intended as a replacement for underlying datasets but as an analytically transparent device that integrates AI adoption capacity with the institutional conditions most relevant to lawful and accountable public deployment. The weighting scheme assigns 40 percent to AI readiness, 35 percent to rule-of-law performance, and 25 percent to digital-government maturity. This weighting reflects the argument that technical readiness must be moderated by legal accountability and supported by digital-administrative capability. The resulting composite score is then used descriptively to rank jurisdictions and analytically to compare trust-oriented preparedness across the sample.

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3.3 Mathematical model and empirical strategy

Three simple equations structure the empirical analysis. First, min-max standardisation is used conceptually to interpret cross-jurisdictional dispersion within each indicator set: $Z_ij = (X_ij - min(X_j))/(max(X_j) - min(X_j))$. Secondly, the composite index is defined as $TPAI_i = 0.40(AIR_i) + 0.35(ROL_i) + 0.25(EGDI_i)$, where AIR denotes the Oxford Insights readiness score, ROL denotes the rule-of-law score rescaled to 0-100, and EGDI denotes the UN e-government score rescaled to 0-100. Thirdly, an exploratory ordinary least squares model is estimated to examine whether AI readiness is associated with rule of law and digital-government maturity: $AIR_i = \beta_0 + \beta_1 ROL_i + \beta_2 EGDI_i + \varepsilon_i$.

The statistical ambition of the paper is deliberately modest. With a sample size of eight jurisdictions, the regression results are interpreted as exploratory rather than causal. The goal is not to infer universal parameter values but to observe whether the empirical pattern is directionally consistent with the theoretical claim that trustworthy public-sector AI is facilitated by stronger legal and digital institutions. Descriptive

statistics, a correlation matrix, and a small-sample regression are therefore paired with close textual interpretation. This approach is appropriate for an interdisciplinary paper in which the quantitative analysis supports, rather than substitutes for, institutional and legal reasoning.

3.4 Ethical, legal and methodological limitations

Several limitations should be stated clearly. First, cross-national indices capture broad institutional conditions rather than direct measures of every AI system deployed by public authorities. The data therefore speak to enabling environments for trustworthy public AI, not to case-level legality in every agency or court. Secondly, index methodologies differ in construction, coverage, and update cycles. Although the selected measures are reputable and publicly documented, any composite indicator necessarily embeds judgment about weighting and comparability. Thirdly, because the study uses a small purposive sample, the quantitative section should be read as analytically illustrative and hypothesis-generating.

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From an ethical standpoint, the study uses only public, aggregate, non-personal data and publicly available policy documents. No human subjects were recruited, no personal administrative records were processed, and no automated decisions were taken by the study itself. Even so, the paper takes a cautionary approach to metric construction. It emphasises that indices can inform governance but should never be treated as a substitute for context-specific legal review, stakeholder engagement, or impact assessment. In legal and public-administrative domains, measurement is valuable only when it remains subordinate to the broader principles of rights protection, due process, democratic accountability, and institutional learning.

4. Results

4.1 Cross-jurisdictional descriptive profile

Table 4.1 presents the core real-data dataset assembled for this study. The table immediately reveals that high-performing jurisdictions on one dimension do not always display the same relative position on another. The United States leads the sample on AI readiness, while Denmark leads on the UN E-Government Development Index and on the World Justice Project rule-of-law measure. Singapore performs

exceptionally strongly on AI readiness and digital-government maturity, whereas Estonia combines high digital-government and rule-of-law scores with slightly lower AI readiness than the top two performers. At the lower end of the sample, India and South Africa demonstrate that meaningful digital-government capacity does not automatically translate into equivalent legal or AI-readiness outcomes.

The descriptive pattern suggests that trustworthy public AI cannot be inferred from a single technological indicator. AI readiness captures strategic, technical, and innovation capacity, but public legitimacy depends on whether institutions can also provide lawful justification, contestability, and administrative reliability. Jurisdictions such as Brazil, India, and South Africa show why this distinction matters. Each exhibits notable digital or policy progress, yet the rule-of-law dimension remains comparatively lower than the leading cases. From the perspective of law and public administration, these gaps indicate where decision-support systems may require stronger procedural safeguards, documentation requirements, and review mechanisms before being used in sensitive public decisions.

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Table 4.1. Real-data cross-jurisdictional indicators used in the study

Jurisdiction	AI Readiness 2024	EGDI 2024	Rule of Law 2024
Denmark	74.71	0.9847	0.9
Singapore	84.25	0.9691	0.78
United Kingdom	78.88	0.9577	0.78
United States	87.03	0.9194	0.7
Estonia	72.62	0.9727	0.82
Brazil	65.89	0.8403	0.5
South Africa	52.91	0.8616	0.56
India	62.81	0.6678	0.5

The values in Table 4.1 indicate that Denmark combines the strongest legal-institutional and digital-administrative conditions, while Singapore and the United States demonstrate exceptionally strong AI capability with different accountability profiles. The United Kingdom and Estonia occupy a balanced middle-upper cluster,

suggesting that moderate-to-high technological readiness paired with strong public-law institutions can support robust decision-support environments. India records the lowest composite institutional profile in the sample because its digital-government gains are not yet matched by equivalent rule-of-law or AI-readiness scores. This does not imply an absence of innovation; rather, it indicates that rapid AI deployment in such contexts should be accompanied by proportionately stronger transparency and oversight design.

4.2 Composite trustworthy public AI index

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The composite Trustworthy Public AI index, shown in Table 4.2 and Figure 4.1, integrates AI readiness with rule-of-law and digital-government capacity. Denmark ranks first with a composite score of 86.00, followed closely by Singapore at 85.23. The United Kingdom, the United States, and Estonia form a tightly grouped upper-middle cluster between 82.07 and 82.79. The lower cluster contains Brazil, South Africa, and India, whose composite scores range from 59.32 to 64.86. The distribution is instructive because it shows that raw AI capacity does not mechanically determine trust-oriented preparedness. The United States remains the highest on AI readiness alone, but its composite position is moderated by a lower rule-of-law score than Denmark, Estonia, and the United Kingdom.

Figure 4.1 makes the same point visually. The two leading jurisdictions are not simply the most technologically advanced; they are the ones in which AI capability appears to be situated within relatively stronger legal and digital institutions. This is particularly important for public administration because trustworthiness depends on whether decision support can be integrated into stable procedures of review, record-keeping, and rights protection. Brazil, South Africa, and India illustrate the opposite challenge: strategic momentum exists, but stronger institutionalisation of legality, openness, and reviewability is still needed if AI is to be used confidently in rights-sensitive or welfare-relevant administrative contexts.

Table 4.2. Composite Trustworthy Public AI Index by jurisdiction

Rank	Jurisdiction	AI Readiness	Rule of Law (0-100)	Composite Index

1	Denmark	74.71	90.00	86.00
2	Singapore	84.25	78.00	85.23
3	United Kingdom	78.88	78.00	82.79
4	United States	87.03	70.00	82.30
5	Estonia	72.62	82.00	82.07
6	Brazil	65.89	50.00	64.86
7	South Africa	62.91	56.00	62.30
8	India	62.81	50.00	59.32

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Figure 4.1. Composite trustworthy public AI performance by jurisdiction

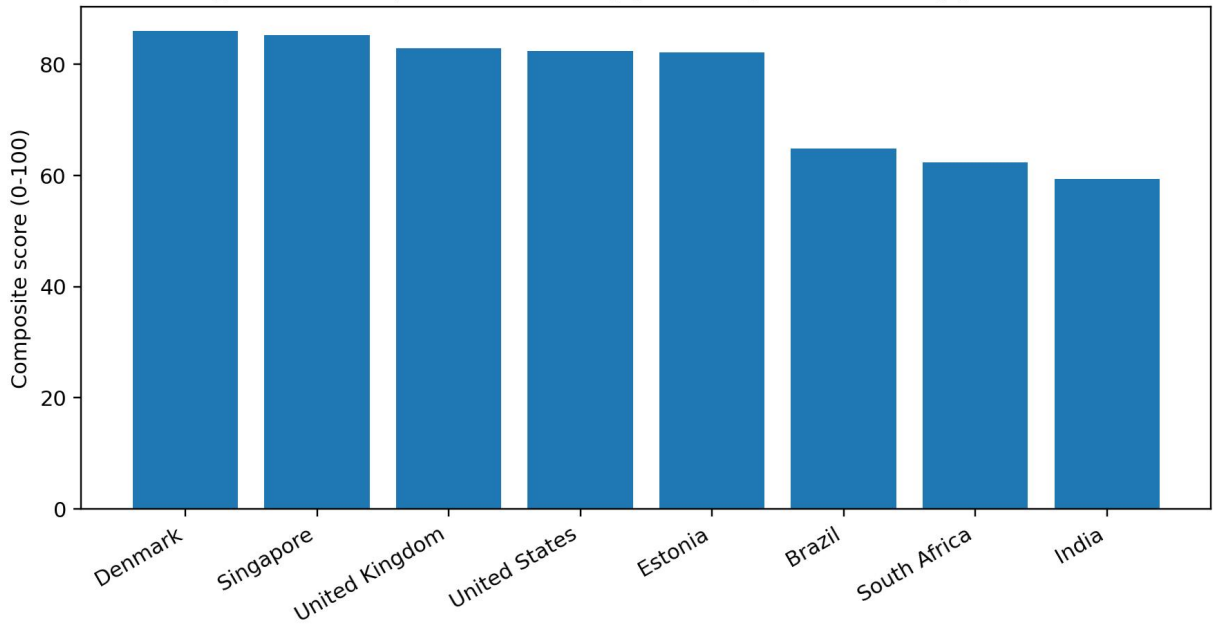


Figure 4.1. Composite trustworthy public AI performance by jurisdiction

The ranking in Table 4.2 confirms that the addition of accountability-sensitive variables changes the comparative picture in analytically meaningful ways. Denmark rises above the United States because its rule-of-law and digital-government scores are stronger, while Estonia becomes highly competitive despite a lower AI-readiness score than the United Kingdom and the United States. This finding supports the paper's central thesis: the quality of public AI governance is not reducible to innovation strength or computational infrastructure alone. A jurisdiction that seeks to

use AI in legal or administrative settings should be assessed through a more demanding lens that includes legality, institutional transparency, and public-sector implementation maturity.

4.3 Correlation and regression findings

The correlation matrix in Table 4.3 shows a positive association across all variables. AI readiness correlates at 0.591 with digital-government maturity and 0.640 with rule of law, while the strongest relationship appears between rule of law and the composite trust index at 0.939. This is substantively important. It suggests that the legal-institutional environment is not an external add-on to trustworthy public AI but one of its strongest correlates within the sample. Digital-government maturity also displays a robust association with the composite trust index at 0.886, indicating that administrative digital capacity remains a necessary implementation substrate for disclosure systems, audit trails, service integration, and interoperable oversight.

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The small-sample regression in Table 4.4 estimates AI readiness as a function of rule of law and digital-government maturity. Both coefficients are positive, with the rule-of-law term larger than the digital-government term in the fitted model. The model explains approximately 41.6 percent of the variance in AI readiness across the sample, but the p-values remain non-significant because the sample is intentionally small and exploratory. The significance of this result is therefore substantive rather than inferential. The direction of association is consistent with the theoretical expectation that governments positioned to use AI responsibly are often those with stronger legal and administrative institutions, even if readiness itself also depends on innovation-sector conditions not directly modelled here.

Table 4.3. Correlation matrix for readiness, digital government, rule of law, and composite trust

Variable	AI Readiness	EGDI (0-100)	Rule of Law (0-100)	Composite Index
AI Readiness	1.000	0.591	0.640	0.849
EGDI (0-100)	0.591	1.000	0.862	0.886
Rule of Law (0-	0.640	0.862	1.000	0.939

100)				
Composite Index	0.849	0.886	0.939	1.000

Figure 4.2. Relationship between rule of law and AI readiness

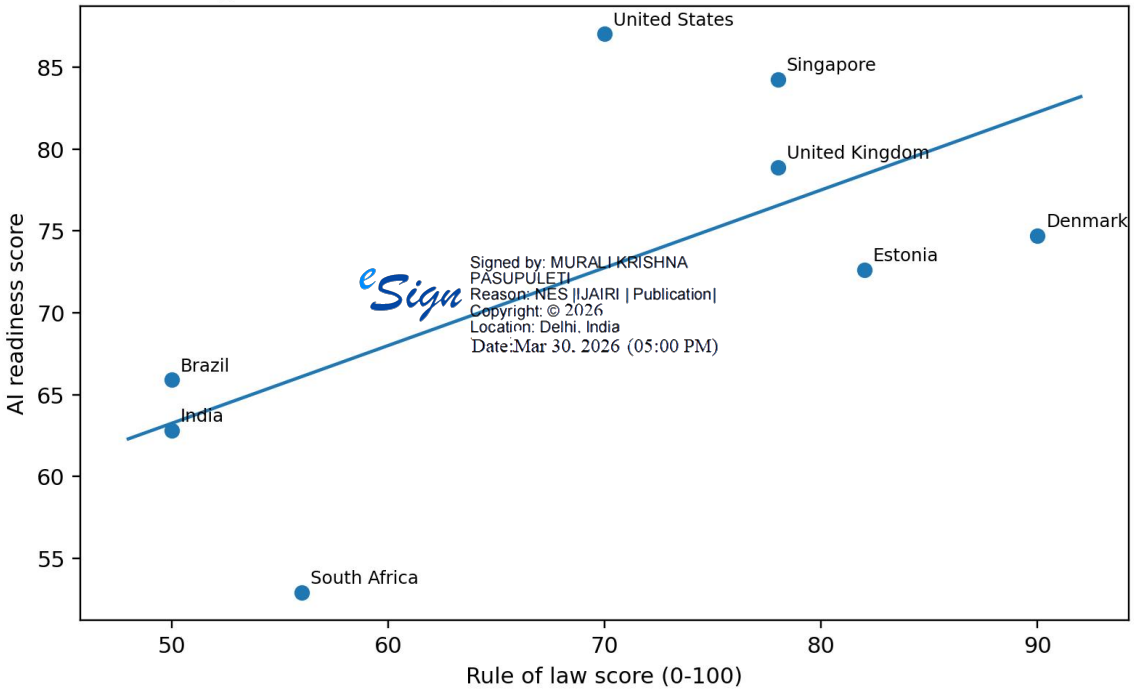


Figure 4.2. Relationship between rule of law and AI readiness in the sampled jurisdictions

Table 4.4. Exploratory OLS model: predictors of AI readiness

Model term	Value
Intercept	31.665
EGDI (0-100)	0.162
Rule of Law (0-100)	0.378
R-squared	0.416
Adjusted R-squared	0.182
F-statistic	1.779
Prob(F-statistic)	0.261

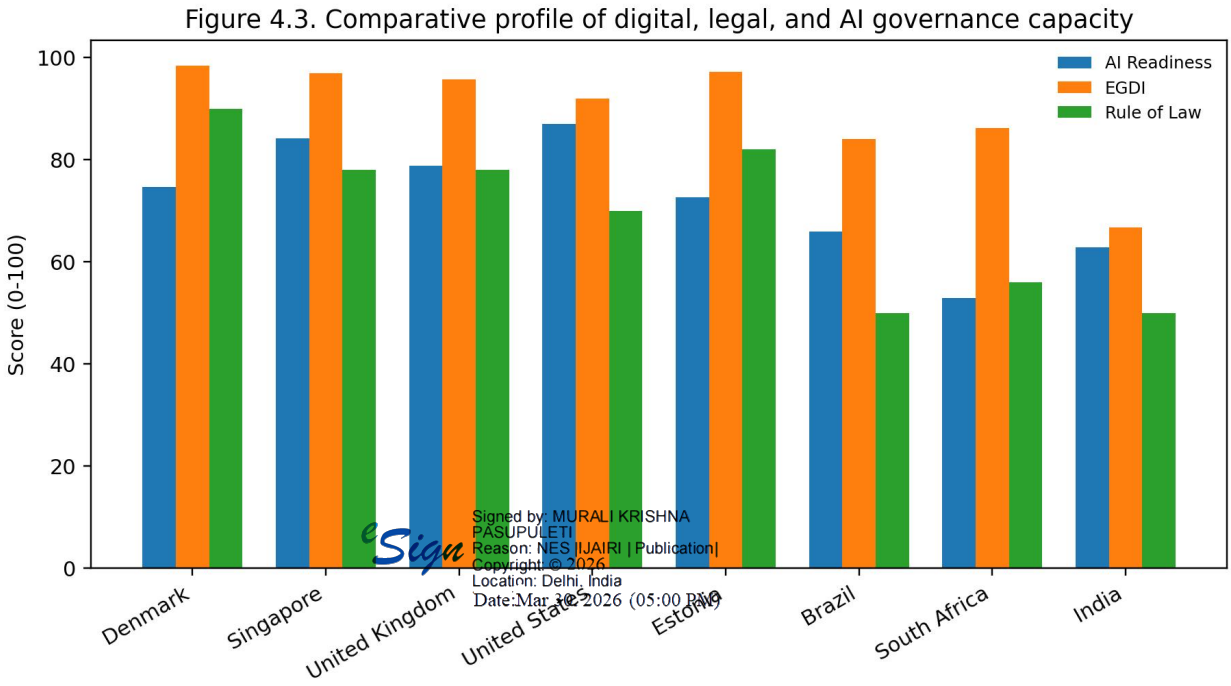


Figure 4.3. Comparative profile of AI readiness, e-government, and rule-of-law capacity

Figure 4.2 shows that the sample broadly trends upward: jurisdictions with stronger rule-of-law scores tend to record higher AI readiness. Denmark, Estonia, and the United Kingdom sit on the high-governance/high-readiness side of the distribution, whereas Brazil, India, and South Africa form a lower-governance/lower-readiness cluster. The United States is a notable case of very high AI readiness combined with a rule-of-law score below the leading European cases, while Singapore combines high AI readiness with strong digital-government maturity and a solid, though not Denmark-level, rule-of-law position. Figure 4.3 further demonstrates that balanced performance across all three pillars is comparatively rare. Trustworthy public AI appears strongest where the three lines of capacity move together rather than diverge sharply.

4.4 Jurisdictional interpretation for law and public administration

The comparative pattern supports the view that different jurisdictions face different trustworthy-AI governance tasks. For Denmark and Estonia, the primary challenge is not whether institutional foundations exist, but how to maintain transparency, lawful documentation, and human review as AI tools become more sophisticated and diffuse across public administration. For the United Kingdom, established transparency

instruments such as the Algorithmic Transparency Recording Standard provide a distinctive administrative pathway for publishing algorithm-use records and could be further integrated with procurement governance and mandatory impact assessment. For the United States, the policy direction represented by OMB Memorandum M-24-10 and agency compliance plans is a significant step toward federal governance coherence, yet the empirical pattern suggests that governance maturity must keep pace with an exceptionally advanced AI ecosystem.

For Singapore, the results highlight the value of sustained state capacity, digital infrastructure, and governance experimentation. For Brazil, India, and South Africa, the findings point toward a developmental governance agenda: investment in AI should be matched by stronger legal reviewability, public documentation norms, sector-specific audit protocols, and institutional safeguards for individuals affected by automated or AI-assisted administrative action. The key implication is that trustworthy public AI is not produced by importing a single global model. It requires each jurisdiction to align AI deployment with its own administrative traditions, constitutional commitments, and implementation capacity, while still converging on common minimum standards for transparency, accountability, and contestability.

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5. Discussion

5.1 Implications for legal institutions

The results reinforce a basic proposition for courts, tribunals, regulators, and ministries: AI may assist legal reasoning and administrative processing, but it cannot displace the normative duties that make public authority legitimate. Legal institutions must remain able to articulate grounds for action, separate relevant from irrelevant considerations, review evidence, and respond to challenge. This means that procurement contracts, model documentation, and internal governance frameworks must be drafted in legally intelligible terms. A system that cannot generate a reviewable record of data inputs, operational purpose, oversight roles, and exception handling is institutionally unsuitable for high-stakes legal or administrative use.

A second implication is that legality reviews should move earlier in the AI lifecycle. Traditionally, legal scrutiny often occurs after deployment or after harm becomes visible through complaints or litigation. Trustworthy AI governance requires a more

anticipatory model in which legality, proportionality, rights impact, and procedural contestability are considered at design, procurement, pilot, and scaling stages. This shift aligns with the risk-based orientation seen in current international instruments and should be embedded in public law doctrine through impact assessments, documentation duties, disclosure standards, and judicial readiness to examine algorithmically mediated administration.

5.2 Implications for public administration

For public administration, the central lesson is that AI adoption should be governed as an organisational reform, not merely as a technology procurement exercise. Administrative systems need capability in data governance, records management, staff training, internal audit, cybersecurity, complaints handling, vendor management, and change management. Trustworthy use of AI depends on whether these capabilities are institutionally coordinated. In practical terms, agencies should identify high-impact use cases, classify them by risk, define mandatory review thresholds, establish override logging, and ensure that public-facing notices explain when algorithmic tools are involved in service delivery or enforcement.

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The findings also suggest that decision support should remain the default governance posture in sensitive public domains. This posture preserves the possibility of human deliberation while still capturing the benefits of triage, pattern detection, and document assistance. However, decision support must be made real through workflow design. Frontline officials need enough time and authority to depart from model outputs, and managerial metrics must not penalise principled disagreement with automated recommendations. Without those organisational conditions, apparent decision support can harden into invisible automation, undermining both legality and citizen trust.

5.3 Governance design principles for trustworthy deployment

Three design principles emerge from the analysis. First, transparency should be layered. Public institutions should provide external notices, internal technical documentation, and oversight-level audit access tailored to different users. Secondly, accountability should be distributed but not diluted. Responsibility maps should specify who owns the use case, who validates data quality, who reviews outputs, who

handles complaints, and who can suspend deployment. Thirdly, decision support should be bounded by contestability. The public must know when AI is involved, retain access to human review, and receive reasons that are intelligible without specialised technical knowledge.

These principles imply a concrete governance checklist for law and public administration: lawful authority to deploy; documented purpose limitation; risk classification; procurement clauses on documentation and audit access; bias and performance testing; public disclosure where appropriate; appeal and correction pathways; periodic review; and independent audit or ombuds oversight for higher-risk systems. Such measures do not eliminate all uncertainty, but they make state use of AI more visible, more controllable, and more legitimate. In that sense, trustworthiness is not a claim about perfection. It is a claim about whether institutions can justify, monitor, contest, and improve the algorithmic tools they use in the exercise of public power.

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6. Conclusion

6.1 Summary of findings

This study set out to examine how trustworthy AI can be constructed for law and public administration through the linked principles of transparency, accountability, and decision support. The doctrinal analysis showed that major international AI governance instruments converge on a common institutional message: AI systems used by public authorities must be documented, reviewable, rights-conscious, and subject to meaningful human oversight. The empirical analysis, grounded in real 2024 data from Oxford Insights, the United Nations, and the World Justice Project, further demonstrated that jurisdictions with stronger rule-of-law and digital-government foundations tend also to display stronger conditions for trustworthy public-sector AI. High technical readiness alone is therefore insufficient.

The composite index and supporting correlation patterns reveal that trust-oriented preparedness depends on alignment across technological, legal, and administrative domains. Denmark and Singapore emerge as the strongest overall performers in the sample because they combine AI capability with stronger governance conditions. The United States illustrates that world-leading AI capacity can coexist with a

comparatively weaker accountability profile than some peer jurisdictions. Brazil, India, and South Africa show that policy ambition and digital progress remain important but must be matched by institutional safeguards if AI is to be deployed credibly in rights-sensitive public contexts. These findings support a governance model centred on reviewability, documentation, and procedural fairness.

6.2 Recommendations and future research

The immediate policy recommendation is that governments should treat transparency, accountability, and contestability as first-order design criteria for public-sector AI. This requires mandatory algorithm-use records, risk-based impact assessment, public notice where rights or entitlements are affected, clear human-review pathways, procurement obligations for documentation and auditability, and periodic independent review. Judicial and administrative oversight bodies should also build internal capacity to evaluate AI-related evidence and governance records. Public-sector AI cannot remain a black-box procurement domain if it is to coexist with democratic legality and administrative justice.

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Future research should expand the jurisdictional sample, incorporate sector-specific case studies, and distinguish more carefully between different public uses of AI, such as service triage, fraud detection, judicial analytics, licensing, and welfare administration. It should also explore longitudinal changes as the EU AI Act becomes increasingly applicable, as the Council of Europe AI Convention is implemented, and as national public-sector governance instruments mature. A promising avenue would be to combine country-level readiness indicators with agency-level transparency records, audit outcomes, and litigation patterns. Such work would deepen the evidence base for evaluating whether public AI remains a tool of accountable decision support rather than a mechanism of opaque administrative power.

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