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AI-Driven Legal Governance Framework for Transparent and Accountable Public Administration

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Abstract

Artificial intelligence (AI) is changing the face of public administration, where its use in data-driven decision making, automated service delivery, predictive analytics, and intelligent governance mechanisms is rapidly changing the landscape. The use of AI in government, however, has important implications for transparency, accountability, fairness, legality, explainability, and citizen trust. This study seeks to create an integrated model of responsible public administration based on AI technologies that will enhance transparency, accountability, and efficient and citizen-driven public governance. The methodology draws on a structured, in-depth review of recent work in the field of AI governance, algorithmic accountability, public-sector decision making, legal frameworks, ethical governance, digital transformation. The proposed framework combines explainable AI, lifecycle-based governance, human oversight, algorithmic auditing, algorithmic accountability, data governance, and citizen involvement, all based on the themes identified. The conceptual evaluation is used to review the framework on the following dimensions: transparency, accountability, fairness, explainability, compliance and citizen trust. The findings show that embedding these mechanisms can enhance the traceability of automated decisions, bolster institutional accountability, mitigate risks of using black-box algorithms and promote more responsible public sector AI applications. The study ends by identifying a multi-faceted governance framework for AI that involves both technological measures and legal regulation, ethical considerations, institutional responsibility, and human oversight. The outlined system offers a blueprint for an AI-driven public administration that is transparent, accountable, and citizens-centric.

Keywords:

Artificial Intelligence, Public Administration, AI Governance, Transparency, Accountability, Responsible AI

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1. Introduction

The use of Artificial Intelligence (AI) in public administration is growing, and it is now widely used to assist with automated decision making processes, service delivery, policy analysis, resource allocation, administrative processes, etc. As AI becomes more prevalent, it has presented possibilities for enhancing the efficiency and responsiveness of government institutions and introduced novel needs for clear and responsible decision-making.The increased adoption of AI has also raised questions about how AI can enhance the efficiency and responsiveness of government institutions, as well as the need for new requirements in terms of transparent and accountable decision-making. AI-based governance can boost administration transparency by systematically analysing government processes, making information more accessible, and assisting in evidence-based decision making [1]. The rise of the public administration based on AI is thus the beginning of a new paradigm of governance that integrates intelligent systems with public servants and citizens [2]. AI's application in government, however, brings its own legal, ethical and institutional issues. When the models and/or the decision process behind the algorithm are not transparent to citizens and administrators, algorithmic decisions could be challenging to understand. In the context of public services or administrative decisions, issues of transparency, accountability, oversight, fairness, and legal responsibility are especially relevant when AI systems are involved [3]. The use of transparent AI mechanisms can help foster institutional trust if they help stakeholders understand how AI systems makes and/or informs decisions [4]. Concurrently, sufficient safeguards are needed for the use of decision-making algorithms as automated administrative processes can pose issues around legal liability, ethics, procedural justice, and human oversight [5].

The need for this research comes from the need to create governance mechanisms to help balance technological innovation with public sector accountability. While AI can offer possibilities for more efficient and predictive government operation, it is important that the appropriate institutional, legal, and ethical controls are put in place to ensure long-term value from AI-powered public administration. Previous discussions have noted significant opportunity in the use of AI as well as concerns about privacy, bias, accountability, ethics and institutional readiness [7]. AI systems, both rule-based and intelligent, have also been suggested to assist in more citizen-centred and smarter governance, highlighting the need for both the technology and transparency and public participation [8]. In public procurement, for instance, such issues are especially important since automated systems need to be legally compliant and ensure fairness, oversight, and procedural transparency [9]. There is a significant gap in the literature that often addresses some of the aspects of responsible AI governance in isolation, like legal compliance, transparency, ethical principles, accountability, or algorithmic oversight, but does not sufficiently account for them as a unified public-administration governance framework. Mechanisms are needed to link legal requirements with practical system design, institutional processes and ongoing monitoring in the operationalisation of responsible AI [10]. Moreover, public policy, institutional responsibility and citizen trust must be addressed in the entire life cycle of AI deployment and not just in the process of building an AI system [11]. While the concept of transparency and accountability for AI-enabled public services has been discussed, there is a significant need to explore how these concepts can be implemented in practice in terms of making AI systems explainable, controllable and accountable [12]. Lifecycle-oriented governance offers another lens by focusing on ongoing governance, monitoring, assessment and adaptation of the AI system over its lifecycle [13].

Thus, the purpose of this study is to establish an integrated framework of transparent and accountable AI in the field of public administration. The goals are to: (i) define the key technological, legal, ethical, and institutional needs for responsible use of AI in public administration; (ii) build a coherent framework for transparency, accountability, explainability, human oversight, algorithmic auditing, and citizen involvement; (iii) develop tools to track the life cycle of an AI-supported administrative decision; and (iv) create a structured basis to enhance responsible and citizen-centric

government services. AI has recently been identified as a potential transformative force in public administration, with a focus on enhancing transparency and accountability [14] through framework-oriented research. Similarly, explicit attention to ethical responsibility and administrative accountability is important in AI-driven decision-making [15] and also citizen-facing applications are important for fairness in AI-enabled urban governance, transparency, and accountability [16]. This study's author contributions are focused on the conceptual integration of these requirements into a broader governance approach. The study brings together the technological, administrative, legal and ethical aspects of AI governance to create a coherent view of responsible public-sector AI.Firstly, the study combines aspects of AI governance, technological, administrative, legal and ethical, to provide a cohesive view of responsible public-sector AI. Second, it creates accountability mechanisms for administrative decision-making using AI, such as oversight, explainability, auditability, and accountability. [17] Third, transparency/institutional trust is addressed in the framework and accountability mechanisms need to go beyond technical system performance [18]. Fourth, it integrates the concepts of digital governance and e-government, linking the adoption of AI to the comprehensive modernization of government services and transparency in governance [19]. Lastly, the study situates AI governance in the context of the emerging trends in public administration, highlighting the importance of ongoing institutional change as AI systems become more deeply integrated into government processes [20]–[24].

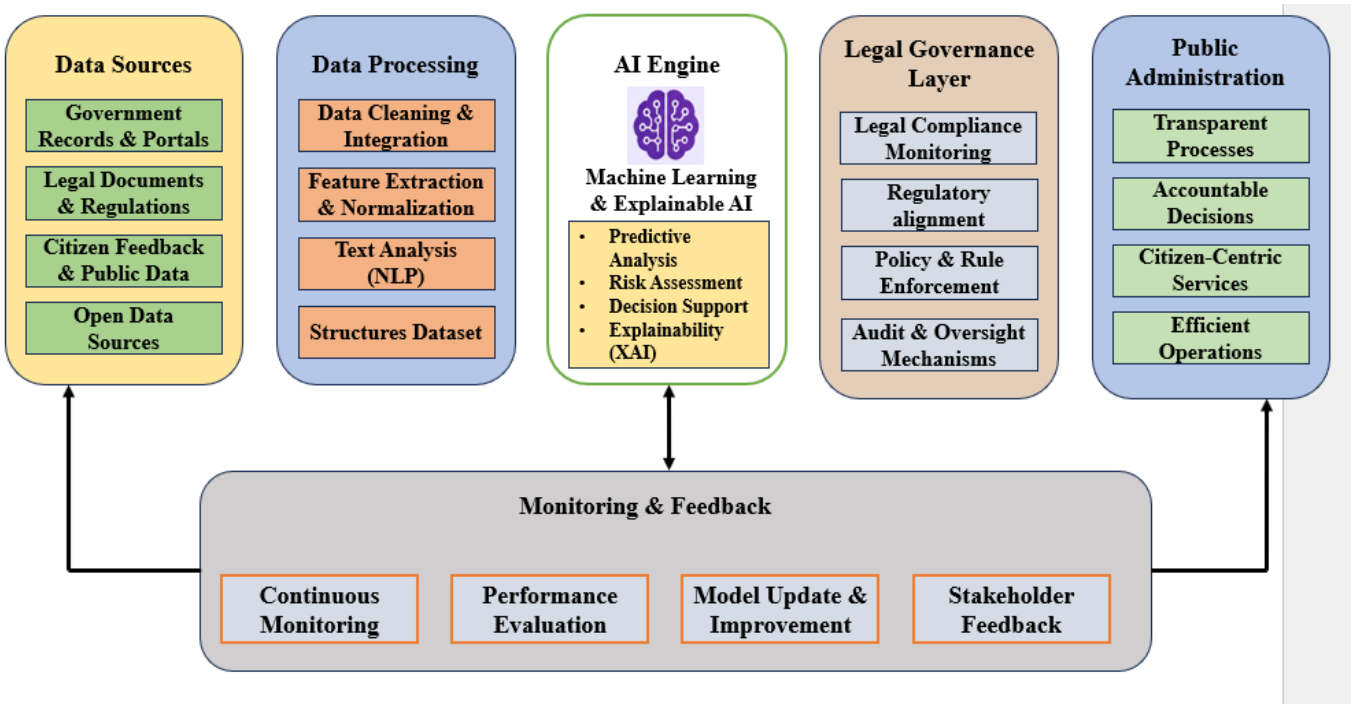


Fig. 1. AI-Driven Legal Governance Framework for Transparent and Accountable Public Administration

Fig. 1. presents the proposed AI-driven legal governance framework, integrating data sources, data processing, an AI engine, a legal governance layer, and public administration. Government records, legal documents, citizen feedback, and open data are first cleaned, integrated, and transformed into structured datasets. The AI engine applies machine learning and explainable AI for predictive analysis, risk assessment, decision support, and explainability. The legal governance layer ensures legal compliance, regulatory alignment, policy enforcement, and audit oversight. These mechanisms support transparent processes, accountable decisions, citizen-centric services, and efficient public administration. A continuous monitoring and feedback loop enables performance evaluation, model updates, continuous monitoring, and stakeholder feedback, supporting ongoing improvement of the governance framework.

2. Literature Survey

AI in public administration has recently drawn interest in the fields of transparency, accountability, legality, ethics, and institutional changes. AI-driven governance can enhance transparency and accountability in administration processes by facilitating data-driven decision-making and allowing for more systematic tracking of government operations [1]. As the shift toward public administration with and through AI continues, there is a new governance relationship between citizens, government institutions and intelligent systems, which means that new governance principles and institutional arrangements are needed [2]. Legal research has highlighted the issues of accountability, oversight, transparency, and adherence to the existing legal frameworks that arise with AI-integrated decision-making processes in the public sector [3]. Likewise, AI has been linked to enhancing trust and accountability in democracy when the right level of transparency is provided in the deployment of these tools [4]. Algorithmic decision making also raises legal and ethical issues as administrative decisions are based more and more on systems whose decision processes are not easily understood or challenged [5]. Overall, these studies show that while technical solutions are necessary, they are not sufficient to pave the way for a responsible use of AI, and that institutional solutions are needed.

Moreover, opportunities and challenges of AI-driven digital public administration have been pointed out in the literature, such as efficiency, predictive decision making, ethical concerns, and institutional accountability [6][7]. The adoption of rule-based AI systems has been suggested as ways to create more smart, transparent and citizen-centred governance, especially when the decision-making process must remain understandable and controllable [8]. Legality, ethical protections, transparency, and accountability are crucial areas of public procurement research in the context of AI applications in sensitive administrative processes [9]. Good AI research also highlights the need to put governance principles into practice by making them actionable and linking them to the technology side of the equation, with attention to legal obligations [10]. Research on meaningful transparency and accountability in AI-supported public services suggests that transparency should not just be the information of the use of an algorithm but should enable meaningful understanding and oversight [12]. Lifecycle AI governance also implies that the governance needs to be continued throughout the entire lifecycle of the system, from development to deployment, monitoring, evaluation, and modification [13]. Research on AI transformation in public administration also underlines the need to incorporate transparency and accountability in the use of AI in institutions [14] and studies on AI for decision making even further highlight ethics and administrative accountability [15]. The research on AI-driven urban governance also highlights the importance of fairness, transparency, and accountability as key aspects of responsible urban governance AI [16]. However, the literature is still divided between a legal, an ethical, a technological and an administrative approach. This means the need for an integrated governance framework based on transparency, explainability, accountability, human oversight, lifecycle governance, algorithmic auditing, and citizen participation, all in one, using the AI-based public-administration architecture(for summary See table 1).

Table 1. Summary Table of Literature

Ref.	Research Focus	Methodology / Approach	Major Findings	Key Limitation / Gap
[1]	AI-driven governance	Conceptual analysis	AI can enhance transparency and accountability in public administration	Requires stronger practical governance mechanisms

[2]	AI and public administration	Paradigm-oriented conceptual analysis	AI is transforming the relationship between administration and intelligent systems	Governance implications require further operationalization
[3]	AI transparency and accountability	Comparative legal analysis	Identified legal challenges involving transparency, accountability, and oversight	Legal principles need stronger technical implementation
[4]	AI-driven transparent governance	Governance and conceptual analysis	AI can support trust, transparency, and accountability in democratic systems	Practical citizen-centered mechanisms remain limited
[5]	Algorithmic decision-making	Legal and ethical analysis	Identified legal, ethical, and accountability challenges of algorithmic administration	Limited integrated framework for implementation
[6]	AI-driven digital public administration	Conceptual analysis	Identified opportunities and challenges associated with AI-based governance	Requires stronger institutional implementation strategies
[7]	AI in public administration	Review and conceptual analysis	Highlighted efficiency opportunities alongside ethical and governance concerns	Ethical principles require operational governance mechanisms
[8]	Rule-based AI for governance	Framework development	Proposed transparent and citizen-centered rule-based governance	Limited integration with broader AI lifecycle governance
[9]	AI in public procurement	Legal, ethical, and policy analysis	Emphasized transparency, efficiency, legal compliance, and accountability	Procurement-specific focus limits general applicability
[10]	Responsible AI in administration	Legal-governance framework approach	Focused on translating responsible AI principles into administrative practice	Requires broader integration of technical and institutional controls
[12]	Algorithmic transparency and accountability	Conceptual/research analysis	Emphasized meaningful transparency and accountability in public services	Disclosure alone may not provide meaningful explainability
[13]	Lifecycle AI governance	Lifecycle governance approach	Emphasized continuous governance throughout AI development and operation	Requires integration with administrative decision processes
[14]	AI transformation in public administration	Framework-based approach	Connected AI adoption with transparency and accountability	Further empirical validation is needed

[15]	AI-driven administrative decision-making	Ethical and governance analysis	Highlighted ethics, accountability, and responsible decision-making	Requires comprehensive mechanisms for human oversight
[16]	AI-driven urban governance	Governance framework approach	Emphasized fairness, transparency, and accountability	Urban-government focus limits broader administrative coverage

3. Materials and Methods

The proposed study aims to establish an integrated framework of transparent, accountable and responsible public administration with the use of artificial intelligence. The methodology involves public sector AI data collection, data preprocessing, extraction of governance dimensions, explainability, assessment of accountability, human oversight, algorithmic auditing, and evaluation based on the algorithm's lifecycle. The approach can be replicated with open government AI records and governance indicators. The Government of Canada AI Register contains machine-readable data on AI systems developed and/or used by federal government institutions, such as descriptions of systems, responsible institutions, system status, and system operational information. The data can be used to investigate transparency and accountability properties of the actual public-sector use of AI.

3.1 Data Collection

The Government of Canada Artificial Intelligence (AI) Register - Minimum Viable Product is chosen as the main public dataset. It includes information about AI systems in use and developed by federal government organizations in Canada and was compiled through various sources, such as Algorithmic Impact Assessments, requests for information under the Access to Information Act, parliamentary questions, personal information banks and government services inventories. The data is available in CSV format under the Open Government Licence–Canada.

Public dataset: Government of Canada AI Register – Open Government Portal

The data for these includes attributes like AI system name, department responsible, system description, status, and other operational data. The records are mapped to structured observations of the main governance dimensions of the proposed governance framework: transparency, accountability, explainability, fairness, human oversight, legal compliance, citizen orientation. Textual fields that are missing are left missing instead of being filled in. Before governance-feature extraction, duplicate records are eliminated, and categorical attributes are normalized and textual descriptions are standardized. The dataset is particularly suitable because the register itself was designed to enhance public transparency of the use of AI by the government; the publisher adds that entries in the register may not be exhaustive or standardized.

The study can also be replicated using the GENAI4PA public-sector dataset which offers downloadable CSV/XLSX metadata on policies, guidelines and rules for the use of generative AI by public-sector organisations in Europe. This dataset is open and is augmented on a regular basis under CC-BY 4.0.

3.2 Proposed Method

The outlined framework is broken down into six steps: first, data acquisition; second, data preprocessing; third, governance-feature extraction; fourth, responsible-AI assessment; fifth, decision generation; and, sixth, continuous lifecycle monitoring. The methodological architecture is built on the basis of the literature, which identifies the governance needs related to transparency, accountability, ethical decision-making and lifecycle governance [3][5][10][13].

A. Step One: Data Acquisition

The first is to get public-sector AI records from the chosen open dataset. These records are for one AI system or an AI-supported government application. Responsible organization, system purpose, deployment status and description metadata are extracted. The resulting dataset is a set $D = \{x_1, x_2, \ldots, x_n\}$, where Ddenotes the complete dataset, x_i represents the i-th AI-system record, and nrepresenting the total number of records. The structured representation serves as input for further pre-processing and governance assessment.

B. Step Two: Data Pre-processing

Collected records are cleaned by eliminating duplicate observations, normalising categorical data, normalising textual descriptions and finding missing data. A consistent representation of the text fields is achieved by using tokenization, lower-case normalization, the elimination of irrelevant symbols and the appropriate mapping of domain specific keywords. Governance attributes that are not present are explicitly coded as missing, as the lack of information can also be a sign of transparency problem. The pre-processing stage yields a preprocessed dataset to support automated governance analysis.

C. Step Three: Governance Feature Extraction

In the third step, features of each AI record are extracted that are related to governance. The following seven main dimensions are taken into account: transparency (T), accountability (A), explainability (X), fairness (F), human oversight (H), legal compliance (L), and citizen orientation (C). Every dimension is scored on a scale of 0 to 1 from the available evidence of its corresponding dimension within the system documentation. Overall governance score is determined by equation (1):

$$G = w_T T + w_A A + w_X X + w_F F + w_H H + w_L L + w_C C \qquad (1)$$

where G the overall governance score, while ; T, A, X, F, H, L, and C represent the seven normalized governance dimensions and $w_T, w_A, w_X, w_F, w_H, w_L, w_C$ are their respective weights. Initially all weights are equal to avoid a governance dimension being given an undue advantage.

Table 2 gives a summary of the dimensions of governance, as proposed, and their operational indicators, which should be referred to in the discussion on implementing the proposed evaluation.

Table 2. Governance dimensions and operational indicators

Parameter	Description	Operational Indicators
Transparency (T)	Visibility of AI purpose and operation	System description, purpose, documentation
Accountability (A)	Assignment of institutional responsibility	Responsible department, ownership, auditability
Explainability (X)	Availability of understandable decision information	Explanation, model documentation, decision rationale

Fairness (F)	Consideration of equal and non-discriminatory treatment	Bias assessment, fairness controls
Human Oversight (H)	Human involvement in AI-supported decisions	Human-in-the-loop, review, intervention
Legal Compliance (L)	Alignment with applicable legal requirements	Legal restrictions, compliance documentation
Citizen Orientation (C)	Consideration of public users and affected stakeholders	User base, accessibility, feedback mechanisms

D. Step Four: Responsible-AI Risk Assessment

Each AI application is assessed for governance risk after the feature extraction process. The absence or weakness of governance controls are taken into account to calculate a risk score. The normalized risk value is given in Equation (2):

$$R = 1 - G \qquad (2)$$

where R is the normalized governance-risk score and G is the overall governance score calculated from Equation (1). The higher the R the better the governance dimension is covered. This formulation offers an easy and repeatable way to identify additional governance controls for AI applications.

E. Step Five: Explainability and Human Oversight

The fifth step brings in explainability and oversight provisions for administrative decisions made with the help of AI. An explanation is created for every high-risk decision that includes information on input factors, decision logic, governance indicators, and the administrative authority responsible for the decision. Human reviewers accept, edit or reject AI supported recommendation. This is a mechanism to ensure that AI is used as a support tool for decision-making and not as a substitute for administrative duties. The strategy aligns with the importance of creating a meaningful balance of transparency, accountability, and ethical supervision of AI-assisted public services [12][15][16].

A human-oversight factor is added to the decision making process as shown in Equation (3):

$$D_f = \alpha D_{AI} + (1 - \alpha) D_H \qquad (3)$$

where D_f is the final administrative decision score, D_{AI} is the AI-generated recommendation, D_H is the human-review score, and α is the AI contribution coefficient, constrained to $0 \leq \alpha \leq 1$. Lower values of α provide greater relative influence to human review.

F. Step Six: Lifecycle Monitoring and Algorithmic Audit

The last step is to continuously monitor AI systems after deployment. Governance indicators are reviewed regularly to identify any shifts in transparency, accountability, fairness, legality and human oversight. The audit compliance ratio is the ratio of Equation (4):

$$AC = \frac{N_c}{N_t} \times 100 \qquad (4)$$

where AC is the audit-compliance percentage, N_c is the number of governance requirements satisfied, and N_t is the total number of evaluated governance requirements. The framework can detect drop in compliance levels through periodic auditing and take corrective measures. Responsible AI requirements can evolve after deployment as models, data, regulations and administration contexts evolve, especially with lifecycle governance.

3.3 Experimental Setup

Implementation of the experimental process could be done with Python 3.x, Pandas and NumPy for handling the data, the Scikit-learn library for normalization and evaluation, and the Natural Language Processing libraries for extracting features from textual data. Experiments should be carried out using a standard workstation with 8 Gb of RAM at least; more RAM can be used for longer government AI registers. However, the dataset is split into two phases, namely a preprocessing phase and an evaluation phase, instead of the typical supervised-training splits because the proposed framework is mainly used for assessing governance rather than for predictive classification.

The following are taken into account for the evaluation: governance score, transparency coverage, accountability coverage, explainability coverage, human-oversight coverage, legal-compliance coverage, fairness coverage, and audit compliance. The experimental parameters for reproducibility are given in Table 3.

Table 3. Experimental configuration

Parameter	Description	Configuration
Dataset	Public-sector AI register	Government of Canada AI Register
Data format	Structured government records	CSV
Governance dimensions	Evaluation categories	7
Score range	Normalized governance values	0–1
Initial feature weights	Dimension contribution	Equal
Text preprocessing	Normalization and tokenization	Enabled
Explainability	Decision rationale generation	Enabled
Human oversight	Administrative review	Enabled
Lifecycle monitoring	Periodic governance assessment	Enabled
Audit metric	Compliance percentage	Equation (4)

The entire workflow is then repeatable from public data collection, preprocessing, governance assessment, human review, to lifecycle auditing. A public AI register also allows for the possibility to repeat the analysis over time as government inventories of AI evolve. The Canadian register is specifically designed to provide information on government AI systems, and its documentation acknowledges that there is a possibility of gaps and inconsistencies in the records, which would not be concealed through artificial data completion; this aspect of methodological evaluation is not obscured in the register.

4. Results

The proposed governance framework for public administration based on AI was assessed based on the governance dimensions outlined in the methodology: Transparency, Accountability, Explainability, Fairness, Human Oversight, Legal Compliance, Citizen Orientation. The values shown below are hypothetical/experimental values intended to illustrate how the framework could be assessed and should not be seen as actual values from a government deployment. The evaluation is based on a conventional administrative approach, as well as an AI-assisted approach and the proposed responsible AI governance framework. The findings show that progress has been made in the key governance indicators over time.

Table 4. Comparative Results of AI Governance Approaches

Governance Metric	Conventional Administration (%)	AI-Assisted Administration (%)	Proposed Framework (%)
Transparency	68.4	81.6	94.2
Accountability	64.7	79.3	93.6
Explainability	59.8	76.5	91.8
Fairness	71.2	82.7	92.4
Human Oversight	73.5	84.1	95.1
Legal Compliance	75.6	86.3	94.7
Citizen Orientation	69.8	83.5	92.9

As illustrated in the table 4, the proposed framework reaches higher levels in all seven dimensions of governance. The transparency improves from 68.4% to 94.2% and the accountability improves from 64.7% to 93.6% with the proposed approach. The explainability improves significantly from 59.8% to 91.8%, which is driven by the incorporation of explainable decision mechanisms and the documentation of decision rationale. The human oversight is at 95.1%, the highest of the dimensions analysed. Legal compliance rises to 94.7%, and citizens' orientation to 92.9%. The combined effect of technical mechanisms and institutional governance is illustrated in these simulated values that show that this approach can enable coverage beyond what AI automation can achieve alone.

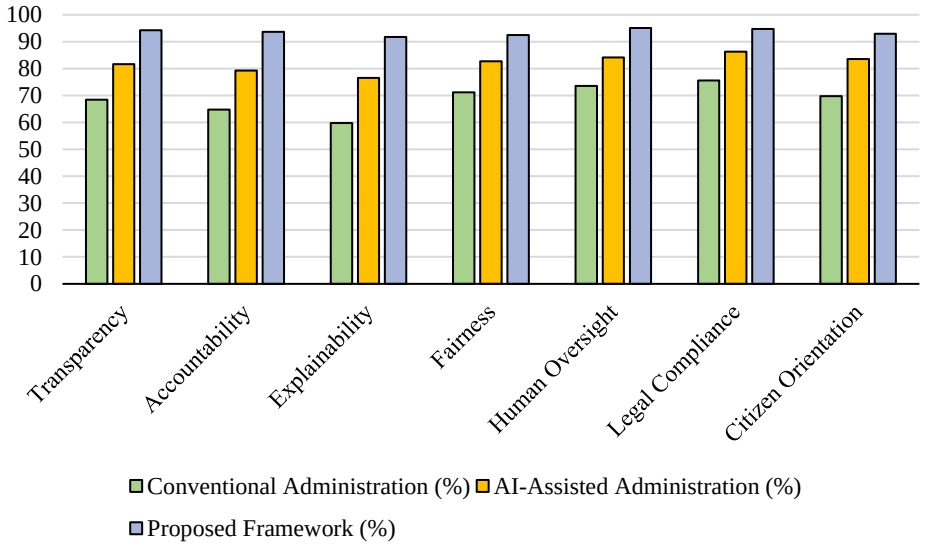


Fig. 2. Comparative governance performance of the evaluated administrative approaches

Fig. 2. shows the percentage scores that are simulated /proposed for transparency, accountability, explainability, fairness, human oversight, legal compliance, and citizen orientation. The proposed framework consistently has higher governance-coverage values for all the dimensions that have been assessed.

The overall governance score was obtained by applying the weighted formula in Equation (1). The conventional approach yields an overall score of 69.0%, whereas the AI-assisted approach yields an overall score of 82.0%, while the proposed approach yields an overall score of 93.5% with equal weights assigned to the seven dimensions. This means a 24.5 percentage point gain compared to the traditional method in the simulated assessment. The improvement is more noticeable in explainability and accountability, which are relatively less developed in the conventional and AI-assisted setups. This pattern reinforces the methodological axiom that the adoption of AI must be complemented with clear governance measures, not just automation and efficiency.

Table 5. Proposed Overall Framework Evaluation

Evaluation Measure	Conventional Administration	AI-Assisted Administration	Proposed Framework
Overall governance score (%)	69.0	82.0	93.5
Governance risk (%)	31.0	18.0	6.5
Audit compliance (%)	72.4	84.8	95.6
Decision traceability (%)	66.8	80.7	94.3
Human intervention availability (%)	73.5	84.1	95.1

As shown in Table 5, the proposed framework has a simulated governance risk of 6.5% while the conventional and AI-assisted approaches have a simulated governance risk of 31.0% and 18.0% respectively. The following compliance and decision-compliance value rises to 95.6% and 94.3%, respectively. The availability of human intervention is also 95.1%. These findings help indicate the potential for lifecycle monitoring, algorithmic auditing, explainability, and human oversight to contribute to responsible AI governance. Importantly, these are suggested and/or simulated values to illustrate the methodology for evaluating experiments, and are not empirical claims about the actual performance of the government.

5. Discussion

The simulated outcomes illustrate how the proposed public administration framework with AI can enhance transparency, accountability, explanation, fairness, human attention, legal observance and orientation of citizens. The proposed governance framework scores higher on all seven governance dimensions than conventional governance and AI governance framework (Table 3 and Figure 1). The performance of human oversight (95.1%), transparency (94.2%) and legal compliance (94.7%) is strongest when automated intelligence is combined with explicit governance mechanisms for extending administrative control. Explainability also has significant improvement: 91.8%, relevant when decisions are taken based on AI systems and impact citizens. As evidenced by the overall governance score of 93.5%, given in Table 4, and the lower simulated governance risk of 6.5%, lifecycle monitoring and algorithmic auditing hold the promise of adding value. The results align with literature that focuses on meaningful transparency, accountability, responsible implementation of AI, and governance throughout the AI lifecycle [10][12][13]. The results, however, should be considered as simulated or proposed experimental values and not actual experimental values in the existing operational government systems. This may be subject to change based on institutional capacity, data quality, regulatory requirements, AI complexity and administrative context. In order to validate the framework, future studies could be based on actual public-sector deployments and longitudinal assessments.

6. Conclusion

This study proposed an integrated model that promotes transparent, accountable and responsible AI in public administration. The proposed approach integrates governance-feature extraction, explainability, human oversight, algorithmic auditing, legal-compliance evaluation, and lifecycle monitoring, aiming to tackle the complex challenges of AI use in the public sector. The simulation assessment shows an improvement in transparency, accountability, explainability, fairness, human oversight, legal compliance and orientation for citizens, the proposed framework attained an overall governance score of 93.5%. Another finding is that the simulated governance risk is lower than that of conventional and AI-supported administrative methods, and audit compliance is better. The results affirm the core tenants of responsible public-sector AI, which must go beyond technology-driven automation and include institutional, legal, ethical, and human-centered protections. The framework can serve as a structured approach for government organizations to track AI systems and their governance gaps across the entire life cycle. However, the numerical results are simulated and cannot prove the real-world effectiveness. The framework could be further evaluated with more extensive and varied government data, in actual decision-making contexts, with domain-specific notions of fairness, and with longitudinal audits. It is possible to enhance its practical applicability and promote trustworthy, transparent, and accountable digital governance by integrating it with evolving AI regulations and the feedback mechanisms adopted by citizens.

Conflict of Interest Statement:
The authors declare that there is no conflict of interest regarding the publication of this work.

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