

## Governance and Ethical Risk Management Framework for AI-Powered Tax Systems: A Post-Coretax Reform Proposal

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### Abstract

*As artificial intelligence (AI) becomes increasingly integrated into public administration, its adoption within Indonesia's Coretax system illustrates both transformative potential and pressing governance challenges. This study investigates Coretax as a case study to explore the ethical, legal, and operational risks of deploying AI in tax administration. While Indonesia's regulatory framework—especially the Personal Data Protection Law (UU PDP) and SPBE e-government regulations—provides a foundational structure, these alone are insufficient to mitigate risks such as opacity, algorithmic bias, and erosion of public trust. Through qualitative analysis of legal mandates, ethical standards from ACM and OECD, and Coretax's documented implementation failures, this study proposes a comprehensive Governance and Ethical Risk Management Framework. The framework incorporates impact assessments, an AI oversight board, transparency mechanisms, privacy-by-design architecture, and continuous monitoring. It is designed to ensure legal compliance, ethical accountability, and sustainable innovation in AI-powered public systems. Policy recommendations include mandating AI impact assessments, enhancing legal oversight, updating SPBE guidelines, and investing in AI governance capacity. By implementing this framework, Indonesia can lead in building trustworthy digital government systems—balancing efficiency with fairness, and innovation with the protection of citizens' rights. The findings offer actionable guidance for policymakers navigating AI integration in high-stakes public services.*

**Keywords:** Artificial Intelligence (AI); Public Administration; Indonesia; Coretax System

### Introduction

Artificial Intelligence (AI) is increasingly being adopted by public institutions to enhance operational efficiency, data-driven decision-making, and service delivery (Anshari et al., 2025; Charles et al., 2022; Poudel, 2024; Srinivasan et al., 2025). In tax administration, AI offers substantial advantages such as the rapid analysis of large datasets, fraud detection, taxpayer behaviour prediction, and automation of routine processes (Pamisetty et al., 2022; Rahman et al., 2024). These capabilities promise improved compliance, reduced administrative costs, and greater procedural fairness in how governments interact with citizens (Wang, 2024).

However, these innovations also introduce a complex set of governance and ethical concerns (Camilleri, 2024). Key challenges include maintaining transparency in algorithmic decisions, mitigating bias, ensuring data privacy, and establishing clear accountability for automated actions (Bibi, 2024; Mensah, 2023). These concerns are particularly salient in systems that make high-stakes decisions affecting citizens' financial and legal standing (Hu et al., 2023). International bodies such as the OECD and ACM have emphasized the need for "trustworthy AI" grounded in principles of fairness, transparency, and accountability (OECD Legal Instruments, 2019).

A salient example of these challenges is Indonesia's Coretax system—an ambitious initiative launched in 2025 to digitally modernize tax administration. Designed to unify five previously disparate platforms, Coretax consolidated taxpayer registration, return filings, audits, and payment processes into a single interface (Arifin et al., 2025). It also laid the foundation for future AI integration aimed at improving audit precision and taxpayer services (Adegbayibi & Ajape, 2025).

Despite its strategic vision, Coretax encountered major operational issues following deployment (Airawaty & Andita, 2025). System crashes, data mismatches, and service disruptions led to administrative confusion and public frustration. Authorities had to temporarily suspend penalties and revert to legacy systems (Sulaiman & Suroyo, 2025). These failures exposed not just technical fragility, but also a lack of preparedness in ethical oversight, data governance, and contingency planning (Owen & Dawson, 2022).

The Coretax case highlights a broader governance gap facing many AI-powered public systems. Modern tax platforms operate within an evolving nexus of regulatory mandates, digital infrastructure, and civic trust. Without clear accountability structures, transparent design principles, and stakeholder engagement, even the most technologically advanced systems can undermine rather than enhance public trust.

Ethical blind spots—such as algorithmic bias in audit selection or lack of redress for automated errors—can be exacerbated in the absence of targeted legal and ethical frameworks (Dirgová Luptáková et al., 2023; Krause, 2024). With increasing use of machine learning models for taxpayer profiling and fraud detection, the need for robust governance becomes more urgent. International experiences demonstrate that without appropriate safeguards, AI systems can disproportionately target marginalized populations, produce unexplainable outcomes, and violate privacy rights (Ahmad et al., 2025; Hoxhaj et al., 2023).

In Indonesia, the imperative to ensure legal compliance is reinforced by recent legislative developments. The 2022 Personal Data Protection Law (UU PDP) mandates stringent protections for personal information, especially in state-managed digital systems (UU No. 27 Tahun 2022, 2022). Additionally, the Electronic-Based Government System (SPBE) regulations require accountability and transparency in public service technologies (PERPRES No. 95 Tahun 2018, 2018).

Indonesia's Coretax system, launched in January 2025, represents a transformative initiative in national tax administration. Mandated under Presidential Regulation No. 40 of 2018, the system was developed through the *Proyek Pembaruan Sistem Inti Administrasi Perpajakan* (Tax Administration Core System Renewal Project). Its primary objective is to modernize and consolidate critical tax functions—such as taxpayer registration, return filing, payment processing, audit case management, and collections—into a unified digital platform (PERPRES No. 40 Tahun 2018, 2018).

By integrating what were once five disparate systems, Coretax seeks to reduce bureaucratic inefficiencies, improve user experience, and enhance the transparency of tax governance. New functionalities, such as real-time dashboards for revenue tracking, exemplify how the platform supports both administrative performance and public

accountability. The reform aligns with broader governance goals to create a more responsive and streamlined public finance infrastructure.

Despite its ambitious blueprint, Coretax faced serious operational difficulties during its initial rollout. These included frequent system downtimes, data migration failures, and synchronization errors, which disrupted tax services nationwide. A government audit in Q1 2025 revealed a discrepancy of more than IDR 2.3 trillion between Coretax records and legacy data, attributed to incomplete and inaccurate data integration. Public frustration intensified as authorities were forced to suspend penalties and temporarily reinstate older systems.

These challenges exposed not just technological shortcomings but also deeper issues of governance: weak contingency planning, lack of stakeholder communication, and insufficient ethical oversight. They underscore a key lesson in digital transformation—technology alone is not sufficient. Success depends on robust implementation, risk management, and accountability mechanisms that extend beyond IT infrastructure.

Coretax is not a static system; it has been designed with extensibility in mind, particularly in the integration of AI. The Ministry of Finance has outlined a strategic roadmap through 2027 to incrementally incorporate AI-based features. These include predictive analytics for detecting tax evasion, machine learning models for compliance monitoring, and AI chatbots to support taxpayer interactions.

Even at present, Coretax uses algorithmic tools to assist in audit selection and data-driven decision-making. However, deeper AI integration raises the complexity of system governance. International precedents show both the benefits and pitfalls of AI in tax administration: while machine learning can enhance detection accuracy and administrative efficiency, it can also introduce opaque decision-making, systemic bias, and legal uncertainty.

As Coretax evolves into an AI-augmented platform, significant ethical and governance questions emerge. An AI system, if not properly designed, may unjustly target certain groups (e.g., small businesses or vulnerable populations) or produce unexplainable outcomes that undermine public confidence. A particularly concerning scenario is the inability of the system to justify its decision—such as selecting a compliant elderly taxpayer for audit—leading to perceptions of algorithmic injustice or surveillance.

These risks are not speculative. They call for proactive governance measures that ensure transparency, fairness, and accountability. This includes explainability protocols, human-in-the-loop mechanisms, and data governance structures that align with both Indonesia's Personal Data Protection Law (UU PDP) and SPBE regulations. In particular, the right to contest automated decisions and demand human review, as guaranteed by UU PDP, becomes a critical safeguard in the deployment of tax AI systems.

Coretax serves as both a cautionary tale and an opportunity—a testbed for the integration of advanced digital technologies in public service. Its future success will rely not only on technical upgrades but on embedding governance and ethical foresight into the system's lifecycle. By aligning its AI strategy with legal mandates and internationally

recognized ethical principles, Indonesia can lead in the responsible use of AI in tax administration.

Previous studies on AI in public sector governance have primarily focused on either technical efficiency or ethical considerations in isolation. Wang (2024) emphasized the potential of AI to enhance operational efficiency and improve decision-making in tax administration, highlighting benefits such as automated fraud detection and faster processing. However, Wang's study did not consider the governance challenges and ethical risks that arise in large-scale implementations like Indonesia's Coretax system. Conversely, OECD Legal Instruments (2019) and ACM (2019) explored ethical frameworks for "trustworthy AI," emphasizing fairness, accountability, and transparency, but their analyses were largely theoretical and not empirically tested in the context of an operational tax system.

This paper addresses these questions by proposing a governance and ethical risk management framework tailored for AI-powered tax administration systems, using Coretax as a case study. By analysing the system's operational and ethical failures and assessing applicable laws and principles, we aim to construct a forward-looking model that guides responsible AI integration in public services. By proactively addressing these governance and ethical challenges, Indonesia—and other nations embarking on similar reforms—can ensure that AI supports, rather than undermines, the goals of fairness, legality, and public accountability in digital government. The findings are expected to inform policymakers and public administrators on designing AI systems that not only optimize efficiency but also uphold ethical standards, ensuring equitable treatment of taxpayers and resilience in digital transformation initiatives.

## **Methodology**

This study employs a qualitative case study methodology to examine the implementation of Indonesia's Coretax system. This approach is particularly suited to exploring contemporary issues within complex, real-life settings where the boundaries between technological innovation and institutional governance are not clearly demarcated. Data was collected through document analysis of official reports, policy documents, news articles, and stakeholder testimonies related to the Coretax rollout. Triangulation across these sources enabled a comprehensive understanding of implementation failures, governance shortcomings, and ethical blind spots.

## **Legal and Regulatory Implications under UU PDP and SPBE**

In deploying AI-driven public systems such as Coretax, the government must navigate a complex landscape of laws and regulations. Two key pillars of the Indonesian legal framework are the Personal Data Protection Law (UU PDP) and the Electronic-Based Government System regulation (SPBE). These establish requirements for data privacy, system security, transparency, and accountability that directly inform how Coretax is governed. Below, we assess Coretax in light of these laws, identifying compliance obligations and potential gaps.

***Personal Data Protection (UU No. 27 of 2022)***

UU PDP – enacted as Law No. 27 of 2022 – is Indonesia’s comprehensive data protection legislation, analogous to the EU’s GDPR (UU No. 27 Tahun 2022, 2022). It governs the processing of personal data by both private entities and public institutions, aiming to protect citizens’ personal information and privacy rights. As a government system handling vast amounts of taxpayer data, Coretax is squarely subject to UU PDP mandates. Key provisions of the law include principles of purpose limitation, consent/legality, data minimization, accuracy, security safeguards, and accountability in personal data processing. For example, personal data must be collected for a lawful, specified purpose and not processed beyond that purpose; it must be kept accurate and up-to-date; and appropriate security measures must protect it from unauthorized access or breaches. These principles obligate the Directorate General of Taxes (DJP) to ensure that Coretax only uses taxpayer data for legitimate tax administration purposes and implements strong protections against data leaks or misuse.

The PDP Law also establishes data subject rights that could be highly relevant in an AI-driven tax system. Individuals have rights to access their personal data, request corrections or deletion, and object to automated decision-making that significantly affects them. This last right – to object to decisions made solely by automation – is crucial in the context of AI. If Coretax eventually uses AI to make or recommend consequential decisions (e.g. selecting a taxpayer for audit or denying a compliance certificate), affected taxpayers might invoke this right, demanding human review. Compliance would mean DJP needs to provide avenues for individuals to contest or get an explanation for algorithmic decisions, aligning with fairness and due process. Notably, UU PDP requires that when automated processing is used, it should not override the fundamental rights of data subjects without appropriate safeguards.

Another major obligation under UU PDP is the requirement for Data Protection Impact Assessments (DPIAs) for high-risk data processing activities. The law mandates controllers like DJP to conduct DPIAs especially in scenarios including: (1) use of automated decision-making that has legal or significant effects on individuals, (2) processing of sensitive (“specific”) personal data, (3) large-scale data processing, (4) systematic monitoring or profiling, (5) data matching from multiple sources, (6) use of new technologies, or (7) processing that restricts data subject rights. Coretax arguably triggers several of these criteria. It handles millions of taxpayers’ records (large-scale processing), likely performs systematic evaluation of compliance risk (profiling/monitoring), matches data across databases (e.g. cross-checking third-party financial information), and will use new AI technologies. Therefore, DPIAs are not just recommended but legally required before and during Coretax’s implementation. Through DPIAs, DJP must evaluate potential privacy risks of the system – for instance, risks of data breaches, misuse of personal financial data, or algorithmic errors harming individuals – and demonstrate measures to mitigate them. Conducting such assessments aligns with the ACM Code’s call for “thorough evaluations of computer systems and their impacts,

including analysis of possible risks”. It also operationalizes the OECD AI Principle that “AI systems’ potential risks should be continually assessed and managed”.

UU PDP further requires organizations to appoint a Data Protection Officer (DPO) under certain conditions (e.g. large-scale public data processing). While not explicitly covered in this excerpt, it is expected that DJP would have a DPO or equivalent function to oversee Coretax’s compliance. Moreover, UU PDP prescribes data breach notification duties: if Coretax suffers a data leak, the Ministry of Finance must notify the affected subjects and relevant authority within a stipulated time. This underscores the need for robust cybersecurity and monitoring in the Coretax environment, which we address in our framework as privacy-by-design measures.

It is important to note that UU PDP provides some exemptions or flexibilities for data processing by public institutions in specific contexts. For example, certain data subject rights and controller obligations can be derogated when processing is done “for the public interest in the context of state administration,” including areas like taxation and law enforcement. In other words, DJP may not be strictly required to honor a taxpayer’s request to delete their data or may limit access rights, if such limitations are necessary for tax administration under the law. However, these exemptions do not waive the fundamental requirements of data protection – they mainly allow tax authorities to carry out duties (like retaining data for audits) that might conflict with, say, a right to erasure. Even with exemptions, the PDP Law emphasizes that processing must remain accountable and secure. Thus, Coretax’s implementers must strike a balance between efficient tax enforcement and respecting privacy principles. They should document the legal basis for any derogation of rights (e.g. citing specific provisions that allow use of data for taxation without consent) and ensure that any such derogation is necessary and proportionate.

In summary, UU PDP imposes a rigorous compliance checklist for Coretax. The system must implement privacy-by-design, obtain valid legal bases for processing tax data (the law likely being the basis, rather than consent), uphold data quality and security, facilitate data subject rights (with exceptions as allowed), and perform DPIAs for its AI components. Coretax must align with these principles to ensure lawful data processing and safeguard taxpayer rights (Tikkinen-Piri, Rohunen and Markkula, 2018). Our proposed framework will build on these requirements, embedding privacy impact assessments and strong data governance as core elements.

### ***Electronic Government and SPBE Regulation***

The Indonesian government’s commitment to digital governance is codified in regulations on Sistem Pemerintahan Berbasis Elektronik (SPBE), notably Presidential Regulation No. 95 of 2018. Perpres 95/2018 on SPBE establishes a national e-government framework intended to create “clean, effective, transparent, and accountable governance” as well as “quality and trusted public services” through the use of information and communication technology (PERPRES No. 95 Tahun 2018, 2018). Coretax, as a flagship e-government system in the financial sector, is a direct embodiment of SPBE principles.

The regulation and its related policies have several implications for how an AI-enabled Coretax should be governed:

- a. **Interoperability and Integration:** SPBE calls for integrated electronic systems across government agencies to improve efficiency and coordination. Coretax is already integrating tax administration internally, and plans to interface with other systems (e.g., customs, financial services) by 2027. This integration raises governance questions about data sharing and standardization. For example, as Coretax pulls data from banking or population databases (likely under the One Data Indonesia initiative), it must adhere to data governance agreements and security standards to protect that information. SPBE's emphasis on a national architecture for data and applications (further detailed in Perpres 132/2022 on SPBE architecture) means Coretax should align with approved standards for data exchange, cybersecurity, and interoperability. Our framework will need to ensure compliance with these standards and that risk management covers not just Coretax in isolation, but also its connections to broader government data ecosystems.
- b. **Transparency and Public Services:** A core objective of SPBE is to make governance more transparent and participatory while improving service delivery. Coretax, with features like real-time tax revenue dashboards and online taxpayer services, is a move towards greater transparency and accessibility in tax administration. However, introducing AI into decision processes can either enhance or undermine transparency. On one hand, AI might detect corruption or anomalies more effectively, supporting SPBE's goal to "press down on abuse of authority...through electronic supervision". On the other hand, if the AI's workings are opaque, taxpayers may feel the system is a "black box," conflicting with the ideal of transparent public service. The SPBE regulation implicitly requires that the public should be able to trust and understand government digital services. This supports a legal argument that any AI in Coretax should come with responsible disclosure: citizens should be informed that AI is being used and have access to information about how decisions are made. In our ethical analysis (next section) we note alignment with the OECD principle on transparency here – both point toward the need for explainable AI and open communication to users.
- c. **Accountability and Oversight:** The SPBE framework demands accountable governance. Digital systems like Coretax should improve accountability by logging decisions and reducing discretionary (and potentially corrupt) human interventions. Yet with AI, ensuring accountability can be tricky – who is accountable if an algorithm errs? Under Indonesian administrative law and good governance practices, the agency deploying the system (DJP) remains accountable for outcomes. SPBE doesn't explicitly address AI accountability, but it does call for governance mechanisms for IT systems. This includes regular audits, performance evaluations, and possibly audit trails to track how decisions are made electronically. Incorporating an oversight board or committee for AI, as we propose, fits within SPBE's intent to have structured management and evaluation of government IT. Such oversight could

ensure the AI functions align with public service ethics and legal norms, thereby reinforcing accountability.

- d. **Security and Service Continuity:** While not mentioned in the excerpt above, SPBE regulations (and related technical guidelines) place importance on information security management for government systems. Government Regulation No. 71/2019 (PSTE) and various ministerial directives complement SPBE by requiring data center security, disaster recovery, and protection of electronic information. Coretax must comply with these, especially given the sensitivity of tax data. AI components can introduce new attack surfaces (e.g., data poisoning attacks to corrupt the model). Thus, legally, DJP must ensure the AI's integration does not compromise security. Regular security risk assessments and safeguards (like encryption, access controls, and anomaly detection) are mandated by both UU PDP and general e-government standards.

In essence, SPBE provides the governance ethos that should guide Coretax's evolution: services must be citizen-centric, transparent, secure, and accountable. Compliance with SPBE means AI innovations cannot be deployed in a vacuum of experimentation; they must be measured against their impact on service quality and public trust. If an AI tool in Coretax were to diminish the quality of service (say, by wrongfully flagging many compliant taxpayers, creating burden), it would contradict the goal of "trusted public services". Therefore, adherence to SPBE principles reinforces the need for risk management measures like pilot testing AI on low-risk areas first, monitoring outcomes, and having human-in-the-loop oversight – all of which we incorporate in our framework.

### **Legal Gaps and Challenges**

Our analysis indicates that while UU PDP and SPBE set important requirements, there are gaps when it comes to explicit regulation of AI-specific issues. UU PDP handles data protection robustly but does not explicitly regulate algorithmic fairness or transparency beyond data subject rights. SPBE promotes good governance values but predates the current AI revolution and thus does not provide detailed guidance on AI ethics or risk controls. This means that for now, much of AI governance in Coretax relies on interpretation of broad principles and the initiative of the implementing agency.

Table 1 below summarizes some key legal and ethical gaps identified and how our proposed framework will address them. Before presenting the framework, we discuss the ethical considerations that inform its design.

### **Ethical Considerations: ACM Code and OECD AI Principles**

Legal compliance alone is not sufficient to ensure the responsible use of AI in public service. Ethical principles provide a compass for navigating issues that laws might not fully address, especially in a rapidly evolving field like AI. Two influential sources of guidance are the ACM Code of Ethics and Professional Conduct (adopted by computing professionals globally) and the OECD AI Principles (endorsed by OECD countries,

including guidelines for trustworthy AI). We use these frameworks to evaluate Coretax's design and identify ethical duties relevant to AI governance.

***ACM Code of Ethics and Professional Conduct (2018)***

The ACM Code of Ethics (2018) lays out fundamental ethical principles for computing professionals, many of which directly pertain to building and deploying systems like Coretax (The Code affirms an obligation of computing professionals to use their skills for the benefit of society). Key tenets include: contributing to society and human well-being; avoiding harm; being honest and trustworthy; being fair and non-discriminatory; respecting privacy; and striving for high quality and competence in one's work. Applying these to an AI-powered tax system yields several insights:

- a. **Avoiding Harm and Ensuring Fairness:** Principle 1.2 of the ACM Code implores computing professionals to “avoid harm”, defining harm as negative consequences especially if unjust. In context, an AI that incorrectly labels compliant taxpayers as evaders or exposes private data could cause unjust harm – from financial penalties to reputational damage or psychological distress. Developers and operators of Coretax have an ethical obligation to anticipate and mitigate such harm. The Code suggests careful consideration of potential impacts on all stakeholders and to minimize unintended harm through rigorous testing and safeguards. It also notes that if harms are discovered, professionals must act to mitigate them and even “blow the whistle” if leadership fails to address serious risks. Similarly, Principle 1.4 on fairness and non-discrimination is crucial: it states that technologies should be inclusive and not disenfranchise any group. For Coretax's AI, this means actively avoiding biases – for example, ensuring the AI doesn't unfairly target a particular demographic or SME segment due to skewed training data. The ethical expectation is to use representative data and bias mitigation techniques, and to provide avenues for those unfairly impacted to seek redress (echoing the ACM guideline that even well-designed systems should allow “avenue for redress of grievances”).
- b. **Transparency and Honesty:** The ACM Code emphasizes honesty and transparency in system capabilities (Principle 1.3). For AI in Coretax, this implies that the system's limitations and decision logic should be as open as possible to users and stakeholders. Ethically, it would be wrong to present AI decisions as infallible or to obscure the fact that a decision was machine-generated. The Code specifically calls for “full disclosure of all pertinent system capabilities, limitations, and potential problems to the appropriate parties”. In practice, DJP should communicate to taxpayers when an outcome (like being flagged for review) is determined by an algorithm, and should acknowledge uncertainty or known error rates of that algorithm. Honesty also means refraining from any manipulation of data or results – for instance, not tweaking the AI in non-transparent ways to meet enforcement quotas. This aligns with SPBE's ethos of transparency and builds trust. An honest approach might include publishing an “AI system card” or documentation that describes how the Coretax AI works, what data it uses, and its performance metrics, in accessible language.

- c. **Privacy and Confidentiality:** Principle 1.6 of the ACM Code, “Respect privacy,” holds that computing professionals have a profound responsibility to handle personal data with care. This complements the legal requirements of UU PDP. Ethically, even if the law permits certain uses of taxpayer data, engineers should implement only those that are necessary and proportionate. The code advises minimizing data collection, defining retention periods, preventing unauthorized access, and being transparent about data usage such that individuals can give informed consent or at least are informed about data collection. For Coretax, privacy-by-design is an ethical imperative: for example, if AI models are being trained, use privacy-enhancing techniques (like anonymization or aggregation) to avoid exposing personal details. The Code also suggests enabling individuals to review and correct their data, which resonates with UU PDP’s rights and should be built into the system’s user features (e.g., taxpayers seeing their profile information used in risk scoring). Confidentiality (Principle 1.7) further requires that any sensitive information, such as declared incomes or business secrets that Coretax might process, be kept secure and not disclosed improperly. Ethics would dictate strict access controls – only authorized personnel or processes should access a taxpayer’s data, and only for legitimate purposes.
- d. **Professional Responsibility and Risk Assessment:** Section 2 of the ACM Code addresses the responsibilities of professionals and leaders. Principle 2.5 is particularly relevant: “Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks.”. This endorses the practice of risk assessment (like DPIA) and ongoing evaluation of AI systems. The Code even notes that “extraordinary care should be taken to identify and mitigate potential risks in machine learning systems,” and that if future risks can’t be predicted, the system requires frequent reassessment or shouldn’t be deployed. Ethically, this means that Coretax’s AI components should undergo continuous monitoring and periodic audits for issues such as drift in accuracy or emergent biases. It also means being prepared to rollback or disable an AI feature if it proves unreliable or harmful. Furthermore, Section 3 of the Code (for leadership roles) states that those managing systems must ensure the public good is central and must “articulate, encourage acceptance of, and evaluate fulfilment of social responsibilities” within their organization. In our context, this could translate to the Ministry of Finance’s leadership cultivating an ethical culture where the Coretax development team is encouraged and rewarded for raising concerns, doing thorough testing, and prioritizing ethical considerations alongside technical performance.

In sum, the ACM Code provides a moral framework that reinforces many points of legal compliance but also goes beyond. It calls for proactive fairness, transparency, and a safety-first mindset. The design of our governance framework will reflect these values: e.g., incorporating bias audits (fairness), requiring explainability (transparency/honesty), embedding DPIA and monitoring (avoid harm, risk assessment), and protecting privacy by design.

***OECD AI Principles (2019)***

The OECD's Principles on Artificial Intelligence, adopted in May 2019, are another cornerstone for analyzing AI ethics in the public sector (OECD Legal Instruments, 2019). They outline five broad value-based principles for "responsible stewardship of trustworthy AI", which we paraphrase and align with the Coretax context:

- a. Inclusive growth, sustainable development and well-being: AI should benefit people and society, driving inclusive growth and well-being. For Coretax, this means the AI's purpose should ultimately be to improve public well-being – e.g., by making tax collection more efficient (increasing funds for public services) and making compliance easier for all taxpayers. Inclusivity implies that the benefits of Coretax (like easier tax filing or fairer enforcement) should be accessible to all segments of society, including those less tech-savvy or in remote regions. It warns against AI systems that advantage only certain groups or widens social inequalities. Thus, an ethical AI-powered tax system would, for instance, use AI to identify and assist struggling taxpayers (perhaps by suggesting reliefs or payment plans) rather than solely focusing on punitive measures.
- b. Human-centered values and fairness: AI systems should be designed to respect the rule of law, human rights, and democratic values, including diversity and fairness, with appropriate safeguards (like human intervention where necessary). This principle strongly resonates with both UU PDP and ACM points. In practice, for Coretax this means upholding individuals' rights (such as the right to justice and due process) when AI is deployed. Safeguards like human-in-the-loop mechanisms are advocated – for example, important decisions (tax penalties, fraud accusations) should not be left entirely to an algorithm without human oversight or the possibility of appeal. It also means the system should not discriminate unlawfully. If an AI risk model inadvertently correlates with, say, ethnicity or gender in its outcomes, that would violate this principle. Ensuring diversity in the data and testing the AI for disparate impact are steps our framework will incorporate to uphold human-centered fairness.
- c. Transparency and explainability: There should be transparency and responsible disclosure around AI systems to ensure that people understand when they are interacting with an AI, and can "challenge AI-based outcomes". For a taxpayer, this principle means they should be aware that a decision affecting them was made by or with the assistance of AI. Moreover, they should have enough information to inquire or contest that decision. OECD's mention of enabling challenges aligns with UU PDP's right to object to automated decisions and the general administrative right to appeal. Implementing this might include providing explanation letters to taxpayers flagged by AI (describing factors that led to selection) and maintaining an accessible process to contest any errors. Transparency also extends to policy: the tax authority could publish information about how AI is used in tax administration, which builds public understanding and trust. In the Coretax rollout, DJP has indeed made some public communications, but full adherence to this principle may require deeper

transparency (e.g., releasing bias testing results or model validation reports for public scrutiny).

- d. **Robustness, security and safety:** AI systems must function in a robust, secure, and safe way throughout their life cycle, with continual risk assessment and management. This principle echoes many ACM and legal points about reliability and security. For Coretax, robustness means the AI's decisions should be accurate and the system resilient to errors or tampering. Security is paramount: AI models and the data they use must be protected against cyber threats (imagine a scenario where a malicious actor manipulates the AI by injecting false data to target rivals, as hypothesized by an OECD AI Wonk blog scenario where a foreign state hacked the training data to bias audits). Safety includes not just cyber-safety but also avoidance of catastrophic failures – if the AI fails, there should be fallbacks to manual processing to ensure continuity of tax services (no single point of AI failure should halt tax administration). Continual risk assessment implies ongoing audits and updates (similar to ACM 2.5). Our framework's provisions for monitoring, periodic reviews, and security audits directly support this OECD principle.
- e. **Accountability:** Organizations and individuals developing or deploying AI should be held accountable for its proper functioning in line with the above principles. In governance terms, this means there must be clear ownership of the AI's decisions. Coretax's AI cannot be an orphaned responsibility – the DJP as an institution, and specific roles like system owners or project managers, must be accountable. If the AI causes an error (say false accusation of fraud), accountability principle dictates that the agency addresses the harm and fixes the system, rather than blaming “the algorithm.” This principle also encourages the establishment of oversight bodies or review committees to ensure accountability mechanisms are working. As noted by a tax technology expert, “there should be an organ to oversee the use of AI in the tax administration”. We wholeheartedly adopt that view in our framework by proposing an oversight board. Additionally, accountability in public sector AI might involve external audits or reporting to legislative bodies on the AI system's performance and compliance.

In evaluating Coretax ethically, these OECD principles reinforce many points raised by law and the ACM Code, but they also highlight the international consensus on certain issues (e.g., transparency and human oversight are universally emphasized). The OECD also provides recommendations to governments, such as investing in AI R&D, fostering data ecosystems, and co-operating across sectors for AI governance. One notable recent development (early 2025) is the OECD's launch of a Voluntary AI Risk Management Framework for organizations to report on their AI practices. Indonesia could potentially leverage such international frameworks to benchmark Coretax's governance against global best practices.

### **Legal/Ethical Gap and Proposed Solution in Framework**

Table 1 below summarizes some of the critical governance and ethical risks for AI in Coretax and previews the solutions we propose. This sets the stage for the detailed framework in the next section.

**Table 1. Summary of key legal and ethical gaps in AI-powered tax systems like Coretax, with proposed solutions from the governance framework**

Identified Legal/Ethical Gap or Risk	Proposed Solution in Framework
Privacy risks (mass collection of personal financial data; potential breaches or misuse of taxpayer data) – UU PDP compliance challenge.	Privacy-by-Design Architecture: Implement strict access controls, encryption of sensitive data, and data minimization policies in Coretax. Conduct DPIAs to identify privacy risks early. Ensure compliance with UU PDP provisions on security and retention; appoint a Data Protection Officer to oversee data handling.
Lack of explicit AI regulation: Current laws (UU PDP, SPBE) do not detail AI governance (e.g., no specific requirement for algorithmic transparency or fairness audits).	AI Governance Policy & Oversight: Establish an AI oversight board or committee within the Ministry to create internal policies that fill this gap. This board will enforce ethical AI guidelines (drawing from OECD/ACM) and review AI system designs for fairness and transparency before deployment. It ensures accountability by having a designated body responsible for AI oversight.
Bias and discrimination: AI risk models could unintentionally target certain groups (violating fairness principles and ACM 1.4).	Fairness and Bias Audits: Integrate routine bias testing into the development cycle. Use diverse training data and consult domain experts to identify fairness proxies for protected attributes. The oversight board will review audit results and require bias mitigation (e.g., rebalancing data or algorithmic adjustments) before approving AI tools.
Opacity of AI (“black box”): Taxpayers and even officials might not understand how AI decisions are made, undermining transparency and trust.	Transparency & Explainability Tools: Develop user-friendly explanations for AI decisions. For any taxpayer flagged by AI, provide an explanation report outlining key factors (without revealing sensitive analytics that would enable evasion). Implement an “AI factsheet” for Coretax that is publicly available, describing its AI models’ purpose, data sources, and performance. This aligns with OECD’s transparency principle and UU PDP’s right to information.
No clear appeals process for AI decisions: Affected individuals need a way to challenge automated decisions (as per UU PDP rights and OECD fairness principle).	Human-in-the-Loop & Appeals Mechanism: Ensure that AI decisions (e.g., selecting cases for investigation) are reviewed by human officials before final action. Create a formal appeals process: taxpayers can appeal an AI-driven action, triggering a human re-evaluation. Make this process known to the public, so they have confidence that AI is not the final arbiter.
Accountability gaps: Risk of “algorithmic blame shifting” (officials might deflect responsibility by saying “the AI did it”). No external review currently.	Accountability Framework: Clearly define in policy that the agency and specific officers (e.g., Head of Tax Data Analytics) are accountable for AI outcomes. The oversight board provides internal accountability, and periodic external audits (perhaps by the national audit agency or an independent tech auditor) will be conducted. Findings could be reported to oversight institutions (e.g., Parliament or the Data Protection Authority). This ensures someone is answerable for the AI’s actions, per OECD’s accountability principle.
Cybersecurity and data integrity risks: AI systems could be manipulated (data poisoning, adversarial inputs) or suffer breaches, leading to faulty outputs or data leaks.	Robust Security Measures: Extend existing IT security programs to AI components. This includes validating training data integrity (to prevent poisoning), using secure development practices, and continuous monitoring for anomalies in AI behavior. Regular penetration testing and vulnerability assessments of Coretax should include its AI modules. Also, maintain fallback procedures (e.g., switch to manual processing) if AI components must be taken offline due to a security incident, ensuring continuity of service.
Capacity and expertise challenges: Staff may lack AI expertise or ethical awareness to manage the	Training and Capacity Building: Implement specialized training for tax officers and IT staff on AI ethics, data privacy, and interpretation of AI outputs. Establish a knowledge-sharing program perhaps in collaboration

Identified Legal/Ethical Gap or Risk	Proposed Solution in Framework
system, potentially leading to misuse or over-reliance on vendors.	with academic institutions. By building in-house expertise, DJP can better supervise vendors and make informed decisions about AI use (addressing the ACM 2.2 call for professional competence). Also, involve interdisciplinary teams (legal, ethics, domain experts) in AI project development to broaden perspectives.

The above gaps and responses provide a roadmap for the components needed in our framework. We now turn to constructing the Governance and Ethical Risk Management Framework, detailing how each component functions and interconnects to create a robust governance regime for AI in the Coretax system and similar public-sector AI applications.

## Results and Discussion

### Proposed Governance and Ethical Risk Management Framework

Building on the analysis, we propose a comprehensive framework to govern AI-powered public systems such as Coretax. The framework is designed to ensure legal compliance, manage ethical risks, and institute accountability mechanisms throughout the AI system’s lifecycle. It can be visualized as a layered structure encompassing policy, process, and technical controls, all underpinned by Indonesia’s legal and ethical standards (UU PDP, SPBE values, ACM/ OECD principles). The framework’s components and their interactions are detailed below.

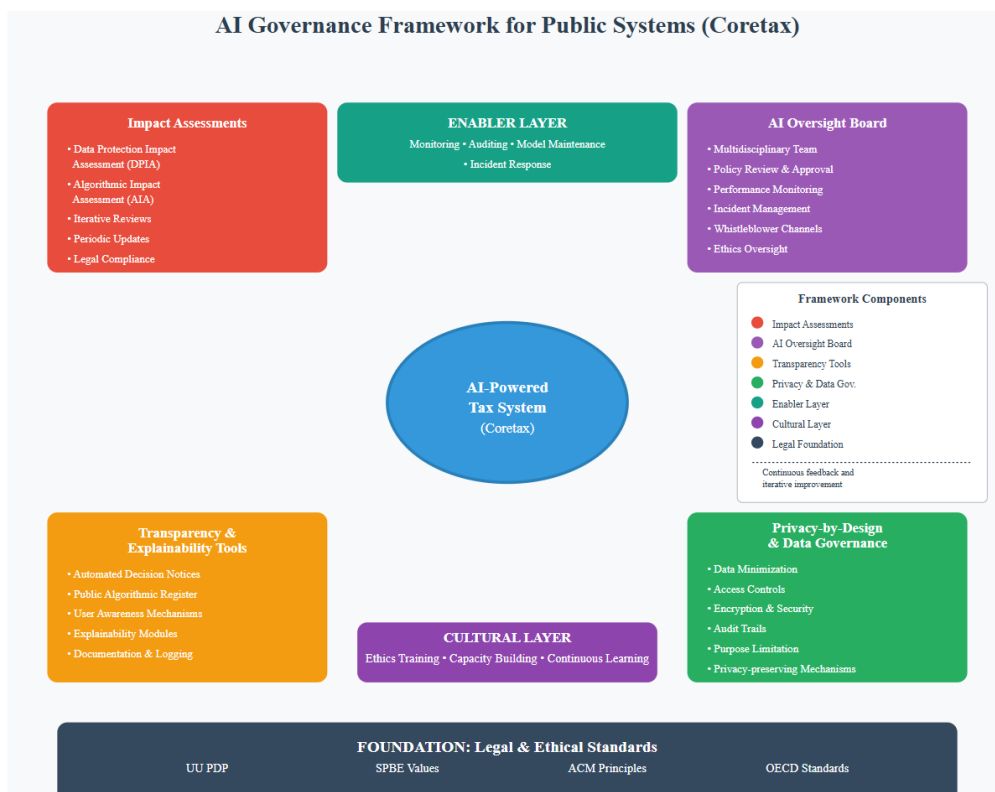


Figure 1. Conceptual Diagram of the AI Governance Framework.

The foundation consists of legal and ethical standards. Built on this are four key governance pillars:

- a. Impact Assessments
- b. AI Oversight Board
- c. Transparency & Explainability Tools
- d. Privacy-by-Design Architecture & Data Governance

These components surround and guide the AI-powered tax system. They ensure ethical constraints are embedded from the design phase, through implementation, and into daily operations. The Oversight Board maintains a feedback loop, Impact Assessments inform design and updates, Transparency tools engage external stakeholders, and privacy architecture protects internal data flows.

### **Impact Assessments**

Before deployment, Coretax must undergo both a Data Protection Impact Assessment (DPIA) and a broader Algorithmic Impact Assessment (AIA). DPIAs examine personal data usage, risks, and safeguards. AIAs focus on fairness, stakeholder impact, explainability, and acceptable error margins. These assessments should be iterative—initially at launch, and periodically afterward to account for system updates or legal changes.

### **AI Oversight Board**

To institutionalize accountability and ensure ethical integrity, the framework proposes the establishment of a dedicated AI Oversight Board within the Ministry of Finance. This board should comprise a multidisciplinary team, including internal stakeholders and independent experts in data protection law, AI ethics, information technology, and public interest advocacy.

The primary functions of the board include reviewing and approving Data Protection Impact Assessments (DPIAs) and Algorithmic Impact Assessments (AIAs) prior to system deployment.

In addition, the board is empowered to issue governance policies—for instance, mandating explainability in all automated decision-making processes. It also assumes a supervisory role in monitoring system performance, particularly with regard to audit trails, fairness, and demographic bias. Moreover, the board is tasked with incident management and the establishment of secure whistleblower channels, enabling internal actors to report ethical concerns or technical anomalies. By embedding such a body in the governance structure, the Ministry ensures that AI adoption remains compliant with legal standards, ethically sound, and trusted by the public.

### **Transparency and Explainability**

Transparency is a cornerstone of ethical AI governance, particularly in public-sector applications. Within the Coretax system, several mechanisms must be embedded to enable comprehensibility and accountability in AI-driven decisions.

Key among these is the provision of Automated Decision Notices, which notify taxpayers when an AI-generated action affects them, such as risk flagging or audit triggers. These notices must include a general rationale and affirm the taxpayer's right to respond or seek review. To support these notices, Coretax must integrate explainability modules that help both internal tax officers and external users understand how and why a specific decision was made. Tools such as SHAP or LIME can aid in simplifying the logic of complex machine learning models.

Furthermore, the Ministry should maintain a Public Algorithmic Register, which outlines the purpose, architecture, and safeguards of each deployed algorithm—excluding sensitive information that could compromise detection logic. Complementing this, enhanced user awareness mechanisms—such as updated privacy notices—must clearly communicate how taxpayer data is used by automated systems and the rights afforded under data protection law. Internally, comprehensive documentation and logging of model training, decision logic, and audit trails must be maintained to facilitate regulatory oversight and institutional transparency.

### **Privacy-by-Design and Data Governance**

To operationalize the principles embedded in the UU PDP, privacy must be incorporated at every level of Coretax's system architecture—a principle known as privacy by design.

This begins with data minimization and purpose limitation, ensuring that only relevant and lawful data is processed, with clearly defined access controls and retention schedules. During development and testing phases, anonymization or pseudonymization should be applied wherever feasible to protect identities. All data storage and transmission must be encrypted to mitigate unauthorized access or breaches.

Additionally, the system must implement audit trails and access logs to monitor how AI decisions are made, reviewed, or overridden. This supports internal accountability and post-incident reviews. Secure development practices, including threat modeling and vulnerability testing, should be embedded within the system development lifecycle. As Coretax interfaces with the One Data Indonesia ecosystem, it must apply privacy-preserving mechanisms in inter-agency data exchanges—limiting access to essential queries and avoiding bulk data transfers unless strictly authorized.

### **Enabler Layer - Monitoring, Auditing, and Model Maintenance**

Governance must continue after deployment through a structured regime of monitoring, auditing, and iterative model maintenance. This enables the system to adapt to changing legal norms, emerging threats, and evolving public expectations.

Key metrics such as accuracy, false positive rates, and model drift must be routinely tracked to evaluate system performance. Bias and fairness audits should be conducted periodically, with particular attention to potential discriminatory outcomes across different demographic or geographic segments. Security audits, including penetration

testing and adversarial simulations, must be employed to identify vulnerabilities in data pipelines or model infrastructure.

A formal incident response protocol must be established to address errors, data breaches, or unintended impacts. This includes steps for halting operations, notifying affected parties, conducting root-cause analysis, and implementing corrective measures. If a model proves unreliable or fails to meet ethical thresholds, the governance framework should empower decision-makers to retrain, decommission, or replace it. Lastly, detailed compliance logs must be maintained to support auditability and accountability, both internally and with external regulators.

### **Cultural Layer - Ethical and Capacity Building**

Beyond technical and procedural safeguards, sustainable AI governance requires a robust organizational culture grounded in ethical values and continuous learning.

The framework emphasizes regular capacity-building programs tailored to different stakeholder groups. Developers and data scientists must be trained in secure coding, privacy engineering, and ethical AI design. Tax auditors and officers who interact with AI-generated outputs require instruction in interpretation and critical judgment, mitigating the risk of automation bias. Senior leadership must champion ethical integrity, allocating sufficient resources for governance implementation and resisting pressures to prioritize efficiency at the expense of trust and compliance.

Internally, a tailored ethics code of conduct should translate high-level principles into practical guidelines—outlining expectations for data handling, model transparency, and ethical whistleblowing. Finally, the institution must commit to continuous learning by tracking developments in international AI governance, participating in global forums, and revising internal policies accordingly.

### **Policy Recommendations**

Implementing the proposed governance framework requires not only internal reform within tax institutions but also strategic policy support from higher levels of government. The following recommendations aim to institutionalize ethical AI governance across public administration:

- 1) **Mandate AI Impact Assessments in Public Sector Regulations.**

The government should formalize AI-specific impact assessments via regulation—broader than the DPIA requirements under UU PDP. A ministerial decree or PANRB circular could require agencies to conduct and publish algorithmic impact assessments for high-impact services. This could be embedded into the SPBE evaluation framework, adding “AI ethics readiness” as a core e-government indicator.

- 2) **Establish a Cross-Agency AI Governance Council**

Expanding the Coretax oversight board model, a national AI ethics council could be formed with representation from key ministries (Finance, Kominfo) and external experts. This body would facilitate policy alignment, share best practices, and review

sensitive AI projects, ensuring a coordinated rather than siloed governance approach—consistent with OECD recommendations for cross-sectoral cooperation.

3) Strengthen Legal Oversight through the PDP Supervisory Authority

As Kominfo operationalizes the PDP supervisory body, it should issue clear guidance on AI in public services—particularly the right to object to automated decisions. This authority could help establish appeal mechanisms, audit AI systems like Coretax, and require periodic compliance reporting, creating an external layer of accountability.

4) Update SPBE and Related Frameworks to Address AI Use

The SPBE Presidential Regulation and technical guidelines should be revised to explicitly address AI ethics, including transparency, accountability, human oversight, and data protection. One Data Indonesia policies (Perpres 39/2019) must also be adapted to ensure AI-related data sharing respects privacy and limits misuse.

5) Invest in Capacity Building and AI Governance Talent

The government should partner with universities and international bodies to train civil servants in AI governance. Initiatives could include an “AI Governance Fellowship” and integration of AI ethics modules into training centers like Kementerian Keuangan’s. Indonesia can also benefit from OECD-hosted workshops and global best practices.

6) Enable External Oversight through Transparency

To build trust, Coretax governance outcomes—within confidentiality limits—should be published through annual reports. Independent evaluations by academics or auditors and participation in international benchmarking (OECD AI Observatory) can validate system credibility and reveal improvement areas.

7) Develop an AI Crisis Response Protocol

Agencies should be required to establish contingency plans for AI failures, including clear communication strategies and manual fallback procedures. Such a plan ensures that if public disruptions occur (e.g., false audits), the response is immediate, coordinated, and trust-preserving.

8) Promote Ethical Innovation through Incentives

Ethics should be positioned as a driver—not a barrier—to innovation. The government can reward AI projects that meet ethical criteria, integrate ethics into public procurement terms, and foster a market for compliance-conscious solutions and vendors.

These policy actions will ensure that Coretax's governance model is scalable and sustainable. More importantly, they position Indonesia as a regional leader in responsible public-sector AI, showing how to harness innovation while upholding legal compliance, ethical standards, and public trust.

## Conclusion

In conclusion, this study demonstrates that integrating AI into Indonesia’s Coretax system can significantly enhance operational efficiency, data-driven decision-making,

and service delivery, provided that robust governance and ethical safeguards are in place. By analyzing Coretax's operational failures, data governance issues, and ethical risks, the research shows that AI deployment must be complemented by transparency, accountability, and human-centric oversight to protect taxpayers' rights and ensure equitable outcomes. The proposed Governance and Ethical Risk Management Framework address these needs by recommending impact assessments, oversight boards, continuous auditing, and ethics reviews, aligning with Indonesian regulations (UU PDP and SPBE) and international best practices (ACM, OECD). The study directly answers the research objectives by identifying the specific governance gaps and offering actionable strategies to mitigate AI-related risks. For future research, this framework can be empirically tested across other AI-powered public services, including broader tax administration systems, social welfare platforms, and municipal service applications, to validate its effectiveness and adaptability. Moreover, longitudinal studies could examine the framework's impact on public trust, compliance, and service efficiency over time, providing valuable insights into the long-term governance of AI in the public sector and contributing to the global discourse on ethical and accountable AI implementation.

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