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Legal Governance of Artificial Intelligence in Sustainable Digital Business Ecosystems

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ABSTRACT

The increasing integration of Artificial Intelligence (AI) into digital business ecosystems is transforming decision-making, data management, customer service, and business automation. At the same time, the growing use of AI raises important legal concerns related to accountability, transparency, data protection, and the allocation of legal responsibility. **This study investigate**s AI legal governance in sustainable digital business ecosystems by examining how regulatory principles can balance technological innovation with legal certainty, human rights, accountability, and sustainability. **A normative legal** research approach is employed through statutory, conceptual, and comparative legal analysis. The legal materials include regulations addressing AI-related activities, personal data protection, electronic transactions, digital governance, and relevant international frameworks, supported by scholarly literature and policy documents. **The findings indicate** that fragmented and technology-reactive regulatory approaches are inadequate for addressing the autonomous and continuously evolving characteristics of AI-driven business activities. Effective governance therefore requires an integrated framework incorporating transparency, explainability, human oversight, risk-based regulation, data protection, accountability, and stakeholder responsibility. The proposed framework places human-centered governance at the core of sustainable digital business development by clarifying the responsibilities of AI developers, providers, and business users while reinforcing institutional oversight. This study advances digital legal governance scholarship by connecting AI regulation with sustainable business transformation and responsible technological innovation. **Adaptive and accountable** legal governance is crucial to ensuring that AI-driven digital ecosystems generate economic value while protecting fundamental rights, public interests, and long-term social sustainability.

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1. INTRODUCTION

AI has rapidly evolved from an experimental computational technology into a fundamental component of contemporary digital business ecosystems. Organizations increasingly deploy AI for automated decision

making, customer profiling, recommendation systems, fraud detection, predictive analytics, content generation, and business process optimization. These applications have created substantial opportunities to improve operational efficiency, innovation, and competitiveness [1]. At the same time, the growing autonomy of AI systems has altered the relationship between technological decision making and traditional mechanisms of human responsibility. Decisions that previously depended on identifiable human actors may now be generated or substantially influenced by algorithmic systems, creating complex questions concerning accountability, transparency, explainability, and legal responsibility [2].

The expansion of AI-driven business activities has also intensified concerns regarding the governance of data and digital rights. AI systems depend extensively on large volumes of personal, behavioral, transactional, and organizational data [3]. The collection, processing, and analysis of such data may create risks involving privacy violations, discriminatory outcomes, unauthorized profiling, cybersecurity vulnerabilities, and opaque decision making. These risks become particularly significant when AI is embedded within digital platforms where automated decisions can affect consumers, employees, business partners, and other stakeholders at considerable scale [4]. Consequently, technological innovation cannot be separated from the legal principles governing data protection, consumer rights, institutional accountability, and responsible digital transformation.

The legal challenges associated with AI are further complicated by the dynamic characteristics of digital business ecosystems. Traditional regulatory frameworks generally establish obligations for identifiable human or corporate actors and are often based on relatively predictable forms of technological activity. AI systems, however, may operate through complex models, continuously changing datasets, automated interactions, and interconnected digital infrastructures [5]. The distribution of responsibility among AI developers, technology providers, platform operators, business users, and other stakeholders can therefore become difficult to determine. This situation creates a regulatory gap between the pace of technological development and the capacity of existing legal institutions to establish clear and enforceable standards of responsibility [6].

The emergence of risk-based and human-centric approaches to AI governance demonstrates an increasing international recognition of these challenges. Regulatory developments in different jurisdictions have sought to establish principles concerning transparency, accountability, risk management, human oversight, and the protection of fundamental rights [7]. However, regulatory approaches remain diverse in scope, institutional design, and enforcement mechanisms. Such differences create additional challenges for digital businesses operating across jurisdictions because AI enabled services frequently involve cross border data flows, multinational platforms, cloud infrastructures, and globally distributed users. A fragmented regulatory environment may consequently increase compliance uncertainty while limiting the effectiveness of legal protection [8].

Within emerging digital economies, these challenges require particular attention. Rapid digitalization has encouraged businesses to adopt AI as a mechanism for improving productivity, expanding market access, and developing new digital services. Nevertheless, regulatory institutions may face limitations in technical capacity, institutional coordination, enforcement resources, and regulatory adaptability [9]. The adoption of AI without corresponding governance mechanisms may therefore generate an imbalance between economic innovation and the protection of public interests. Sustainable digital transformation requires legal frameworks capable of supporting innovation while simultaneously preventing technological development from undermining human dignity, fairness, privacy, and social trust [10].

The concept of sustainability in digital business should consequently extend beyond environmental considerations. A sustainable digital business ecosystem also requires legal, institutional, and social conditions that allow technological innovation to operate responsibly over the long term [11]. AI governance is therefore closely connected with principles of institutional accountability, transparency, inclusiveness, data protection, and stakeholder protection. From this perspective, sustainability requires the establishment of governance mechanisms that ensure AI contributes to economic development without creating disproportionate legal and social risks. Such an approach is consistent with the broader objective of sustainable digital transformation and the development of resilient digital institutions [12].

The proposed AI legal governance framework further contributes to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 8 on Decent Work and Economic Growth, SDG 9 on Industry, Innovation and Infrastructure, SDG 10 on Reduced Inequalities, SDG 16 on Peace, Justice and Strong Institutions, and SDG 17 on Partnerships for the Goals. Accountability, transparency, human oversight, data protection, and risk-based regulation can promote responsible innovation and sustainable digital business while protecting human rights, reducing discriminatory risks, strengthening institutional accountability, and encouraging cooperation among businesses, regulators, technology providers, and other stakeholders. Therefore, in-

tegrating SDG considerations into AI legal governance reinforces the role of sustainable digital transformation in achieving inclusive innovation, responsible institutions, and long-term societal resilience.

Despite the increasing body of literature concerning AI ethics, algorithmic accountability, and digital regulation, an important research gap remains. Existing studies frequently examine AI governance from either a technological, ethical, or general regulatory perspective, while fewer studies integrate AI regulation with the specific governance requirements of sustainable digital business ecosystems [13]. In particular, insufficient attention has been given to how legal responsibility can be distributed across the AI value chain, how transparency and human oversight can be institutionalized within business processes, and how regulatory mechanisms can simultaneously promote innovation and protect stakeholders. This gap indicates the need for a more integrated legal governance perspective that connects AI regulation with the sustainability of digital business ecosystems [14].

Unlike existing AI governance frameworks that primarily emphasize ethical principles, technological risks, or general regulatory compliance, the framework proposed in this study integrates five governance: dimensions accountability, transparency and explainability, human oversight, data protection and digital rights, and risk-based regulation within a sustainability-oriented legal structure [15]. Its distinctive contribution lies in connecting these dimensions throughout the AI lifecycle while assigning governance responsibilities to developers, providers, deployers, business users, and institutional actors. Thus, the framework does not treat sustainable AI governance as a separate ethical or technological objective. Instead, it establishes an integrated legal governance architecture that connects AI accountability, digital rights, institutional responsibility, and sustainable digital business development [16].

This study therefore examines the legal governance of AI in sustainable digital business ecosystems. It seeks to analyze the adequacy of existing legal principles in addressing AI related risks and to identify governance mechanisms capable of balancing technological innovation, business interests, individual rights, and broader societal interests [17]. Particular attention is given to accountability, transparency, explainability, human oversight, data protection, risk-based regulation, and stakeholder responsibility as essential components of responsible AI governance.

The study contributes to the emerging field of digital legal governance in three ways. First, it develops a conceptual understanding of AI governance that positions legal accountability as an essential component of sustainable digital business transformation. Second, it integrates technological governance with principles of digital human rights and institutional responsibility, thereby extending discussions that have traditionally treated these dimensions separately. Third, it proposes an integrated governance framework that can assist policymakers, regulators, digital businesses, and technology developers in establishing more adaptive and humancentric approaches to AI regulation [18]. Through this approach, the study responds directly to the interdisciplinary orientation of Legal Autonomous Web based Governance by connecting computational technologies with legal principles, institutional governance, and sustainable digital development.

The remainder of this article is structured as follows. The next section reviews the theoretical and legal literature concerning AI governance, digital business ecosystems, algorithmic accountability, and sustainability. The methodology section then explains the normative legal research design and the selection and analysis of legal materials [19]. The results and discussion section examines the principal legal challenges of AI-driven digital business and develops the proposed governance framework. The final section presents the conclusions and implications of the study for legal scholarship, policymakers, and digital business stakeholders.

2. LITERATURE REVIEW

2.1. AI, Digital Business, and Legal Governance

AI has become an important technological infrastructure within digital business ecosystems, moving beyond conventional information technology toward systems capable of analyzing data, identifying patterns, generating predictions, and supporting or performing decisions with varying degrees of autonomy [20]. AI is increasingly applied in customer relationship management, personalized marketing, fraud detection, financial services, supply chain management, human resource management, risk assessment, and automated customer services. Its integration has consequently transformed relationships among businesses, technology providers, consumers, regulators, and other stakeholders.

Digital business ecosystems consist of interconnected organizations, platforms, data infrastructures, algorithms, service providers, users, and institutional actors. As a result, the legal consequences of AI de-

ployment may extend beyond the organization directly operating a system [21]. Third-party AI providers, for example, may influence decisions concerning consumer eligibility, pricing, recruitment, credit assessment, or access to digital services. The distributed nature of AI development, deployment, data processing, and business operations therefore creates challenges in determining responsibility across the AI lifecycle.

AI legal governance refers to the legal principles, regulatory mechanisms, institutional arrangements, and accountability structures that guide the development and use of AI in accordance with rights and public interests. Its purpose is not merely to restrict technological innovation but to establish conditions under which AI can operate responsibly and predictably. From this perspective, AI governance must address both technological capabilities and institutional responsibilities because AI increasingly influences transactions, consumer relationships, employment, access to services, and economic opportunities [22].

A central concern is algorithmic accountability. Organizations should be able to identify responsible actors, document relevant decisions, assess risks, and provide mechanisms for monitoring and remediation. Accountability should extend across system design, data collection, development, testing, deployment, monitoring, modification, and termination. Transparency and explainability complement accountability by enabling stakeholders to understand relevant information about AI systems and the reasons underlying consequential decisions [23]. Meaningful transparency does not necessarily require disclosure of proprietary source code rather, its level should correspond to the potential impact and risk of the AI application.

2.2. Accountability, Human Oversight, and Digital Rights

Human oversight is a fundamental component of responsible AI governance because increasing technological autonomy does not eliminate human responsibility. In digital business environments, automated systems may influence consequential decisions involving credit assessment, recruitment, insurance, pricing, consumer profiling, and access to digital services. Effective governance therefore requires mechanisms through which authorized individuals can supervise, review, intervene in, override, or discontinue AI-generated decisions when necessary [24].

Human oversight should be institutionalized through designated responsibilities, AI impact assessments, human review procedures, escalation mechanisms, documentation, auditing, and periodic risk evaluation. These mechanisms transform human oversight from a general ethical principle into an operational governance requirement [25]. United Nations Educational, Scientific and Cultural Organization (UNESCO) recommendation on the Ethics of AI similarly emphasizes responsibility and accountability, transparency and explainability, human oversight, privacy and data protection, fairness, and sustainability as interconnected principles. Importantly, AI systems should not displace ultimate human responsibility for their consequences.

Data governance represents another essential dimension of AI legal governance. AI-driven business models depend extensively on personal, behavioral, and transactional data, creating concerns regarding privacy, data protection, informational autonomy, security, and discrimination [2]. Effective data governance should address lawful collection, purpose limitation, data quality, security, retention, access, sharing, and accountability. These safeguards become particularly important when AI systems combine information from multiple sources or generate inferences about individuals.

The protection of digital human rights extends beyond privacy. Algorithmic systems may influence access to employment, financial services, information, platforms, and other opportunities, while poorly governed systems may reproduce existing biases or generate discriminatory outcomes. Consequently, data protection should be connected with fairness, non-discrimination, human dignity, and the ability of affected individuals to exercise relevant rights and challenge consequential decisions [26]. For sustainable digital businesses, strong data governance and accountability can strengthen stakeholder trust and reduce long-term legal, reputational, and social risks.

2.3. Risk-Based and Sustainable AI Governance

Risk-based regulation should align legal obligations with the potential impact and severity of harm posed by AI applications. Low-risk systems may require basic documentation, data governance, and monitoring, while high-impact systems affecting credit, employment, insurance, consumer eligibility, or essential services should be subject to stronger safeguards, including risk assessment, testing, transparency, human oversight, auditability, incident reporting, and mechanisms for contesting consequential decisions [27]. This proportional approach is particularly relevant to rapidly evolving AI technologies because principle-based frameworks can remain adaptable beyond technology-specific rules. UNESCO emphasizes proportionality, risk assessment, human rights, sustainability, and continuous evaluation, while the European Union's AI Act demonstrates how

risk differentiation can be translated into structured legal obligations. Sustainability should likewise be integrated into AI governance by addressing both AI's benefits for efficiency and resource optimization and its potential social and environmental risks, including energy consumption, discrimination, privacy violations, unequal access, and technological concentration. Thus, sustainable AI governance requires a balance between innovation, legal accountability, human dignity, stakeholder protection, environmental responsibility, institutional trust, and long-term resilience [28].

2.4. Theoretical Synthesis and Research Gap

AI governance is inherently interdisciplinary, involving technological, legal, social, and sustainability dimensions. Although existing studies have examined accountability, transparency and explainability, human oversight, data protection, risk management, and responsible AI, these dimensions are often treated separately, leaving their integration within sustainable digital business ecosystems insufficiently developed. This study addresses this gap by proposing an integrated AI legal governance framework based on five dimensions: accountability, transparency and explainability, human oversight, data protection and digital rights, and risk-based regulation [29]. The framework connects AI governance with technology law, digital regulation, human rights, data protection, platform governance, and sustainable digital transformation, while considering the adaptation of international principles to domestic legal and institutional contexts in emerging digital economies. Using normative legal research and statutory, conceptual, and comparative approaches, the study synthesizes these dimensions into a governance framework that seeks to balance technological innovation, human dignity, stakeholder protection, legal accountability, and long-term sustainability [30].

3. RESEARCH METHOD

3.1. Research Design

This study employs a normative legal research approach to examine the legal governance of AI within sustainable digital business ecosystems. Normative legal research is appropriate because the study focuses on examining legal norms, regulatory principles, institutional responsibilities, and conceptual relationships governing the development and deployment of AI. Rather than measuring the statistical relationship between variables, the study analyzes how existing legal frameworks can respond to emerging challenges associated with AI-driven digital business activities [31]. The research is structured around three complementary approaches: the statute approach, the conceptual approach, and the comparative approach. The statute approach is used to examine relevant legislation and regulatory instruments concerning AI, personal data protection, electronic transactions, digital governance, and related business activities. The conceptual approach is applied to develop the relationship between AI governance, accountability, transparency, human oversight, digital rights, risk management, and sustainability. The comparative approach is used to identify relevant regulatory principles from international AI governance frameworks and compare them with the developing regulatory environment applicable to digital business activities [32].

The research process consists of four main stages: identification of legal and policy materials, classification and interpretation of relevant legal norms, comparative and conceptual analysis, and development of an integrated legal governance framework. The overall research design is presented in Figure 1.

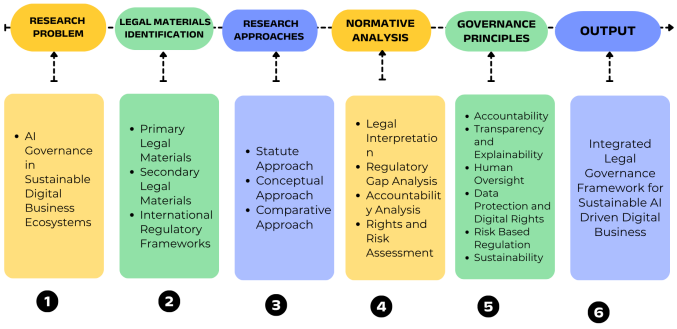


Figure 1. Normative Legal Research Design

Figure 1 illustrates the overall research design, beginning with the identification of the legal problem and progressing through legal material selection, methodological approaches, normative analysis, and identification of governance principles. The final stage produces an integrated legal governance framework designed to reconcile AI innovation with accountability, rights protection, and sustainable digital business development.

3.2. Legal Materials and Selection Criteria

The legal materials are divided into primary and secondary legal materials. Primary legal materials consist of legislation, regulations, and authoritative international regulatory instruments that establish legal obligations or governance principles relevant to AI and digital business. Secondary legal materials include peer reviewed journal articles, academic books, institutional reports, policy papers, and authoritative scholarly publications addressing AI governance, algorithmic accountability, digital rights, data protection, and sustainable digital transformation [33].

The selection of legal materials follows four criteria. First, materials must have direct relevance to AI, digital governance, data protection, electronic transactions, or digital business activities. Second, materials must provide substantive legal or governance principles relevant to accountability, transparency, human oversight, rights protection, or risk management. Third, international instruments are selected when they provide comparative principles that can strengthen the analysis of emerging AI governance. Fourth, scholarly sources are selected based on their relevance, academic credibility, and contribution to the conceptual development of the study [34].

Table 1. Legal Materials and Analytical Functions

Category	**Legal Materials**	**Selection Criteria**	**Analytical Function**
Primary Legal Materials	Indonesian legislation on personal data protection, electronic information, electronic transactions, and digital activities	Binding legal relevance to digital business and data governance	Identify legal obligations, rights, responsibilities, and regulatory limitations
International Regulatory Materials	International AI governance instruments and foreign AI regulations	Relevance to AI accountability, risk, transparency, and human oversight	Comparative assessment of emerging AI governance principles
Secondary Legal Materials	Peer reviewed journal articles and academic books	Scholarly relevance and contribution to AI and digital governance discourse	Develop theoretical and conceptual foundations
Policy and Institutional Materials	Reports, policy documents, and governance guidelines from recognized institutions	Institutional authority and relevance to AI governance	Identify policy principles, implementation challenges, and governance recommendations

Table 1 establishes the categories of materials used in the study and clarifies their respective analytical functions. This classification is important because normative legal research requires a clear distinction between binding legal norms and supporting scholarly or policy materials. The combination of these materials enables the study to examine not only what existing regulations provide but also whether those regulations are conceptually adequate to address emerging AI governance challenges.

3.3. Data Collection and Legal Material Analysis

Legal materials were systematically identified from legislation, regulatory instruments, international governance frameworks, and relevant academic literature concerning AI governance, algorithmic decision-making, digital business, data protection, digital rights, accountability, and sustainability. The materials were

classified by legal status, thematic relevance, and analytical function and analyzed qualitatively through legal interpretation and thematic synthesis [35]. The analysis examined relevant legal provisions, assigned responsibilities across AI developers, providers, deployers, and business users, and compared domestic principles with international regulatory approaches to identify convergence, divergence, and regulatory limitations [36]. The findings were then synthesized into governance dimensions for sustainable digital business ecosystems. Rather than treating AI as an independent legal actor, the study locates responsibility among human and organizational actors throughout the AI lifecycle, enabling the identification of accountability gaps within relationships involving developers, providers, platforms, businesses, consumers, and regulators [37].

3.4. Analytical Framework

The analytical framework integrates the legal findings with five core governance principles: accountability, transparency and explainability, human oversight, data protection and digital rights, and risk-based regulation [38]. Sustainability operates as the overarching objective connecting these principles to the long-term development of digital business ecosystems [39].

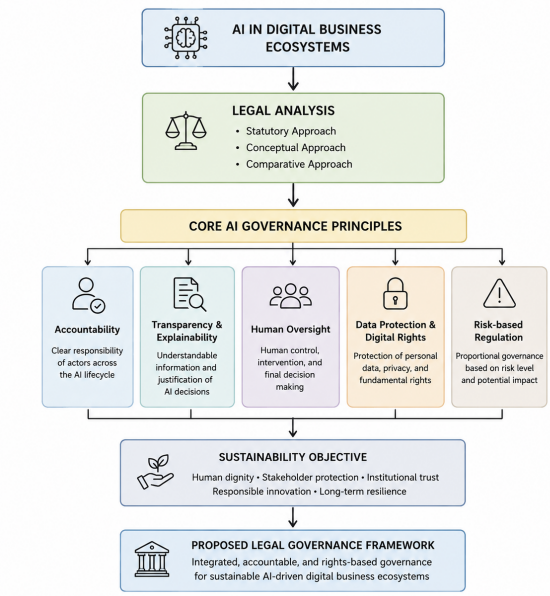


Figure 2. Analytical Framework for AI Legal Governance

Figure 2 demonstrates how the study moves from the technological context of AI-driven digital business toward normative legal analysis and ultimately to an integrated governance framework [40]. The five core principles function as interconnected safeguards rather than isolated regulatory requirements [41]. Accountability determines who bears responsibility transparency and explainability support meaningful understanding of AI decisions human oversight maintains human responsibility data protection and digital rights safeguard individuals and stakeholders and risk-based regulation provides proportional governance according to the potential impact of AI systems [42].

The sustainability objective integrates these principles into a broader governance perspective. Accordingly, an AI system is not considered adequately governed merely because it complies with a particular regulatory requirement [43]. Sustainable governance requires the combined protection of human dignity, stakeholder interests, institutional trust, responsible innovation, and long term resilience [44].

3.5. Validity and Analytical Consistency

To strengthen the validity of the normative analysis, the study applies triangulation across statutory, conceptual, and comparative materials [45]. Legal provisions are not interpreted in isolation but are examined alongside established legal concepts, academic scholarship, and international regulatory developments [46]. This approach reduces the risk of relying on a single regulatory perspective and allows potential inconsistencies between domestic legal provisions and emerging international governance principles to be identified

[47]. Analytical consistency is maintained by applying the same governance dimensions throughout the examination of legal materials [48]. Each relevant regulatory framework is assessed according to its treatment of accountability, transparency, human oversight, data and digital rights, risk management, and sustainability. The resulting comparison provides the basis for identifying regulatory gaps and developing the proposed legal governance framework.

Through this methodological structure, the study seeks to ensure that the proposed framework is grounded in identifiable legal materials and established governance principles rather than being based solely on normative assumptions. The methodology consequently supports the interdisciplinary objective of LAW by connecting legal analysis with the technological and institutional characteristics of AI-driven digital business ecosystems.

4. RESULTS AND DISCUSSION

4.1. Fragmented Legal Governance and Regulatory Challenges

Indonesia's AI governance is currently supported by several legal instruments covering different aspects of AI-related activities, including Law Number 27 of 2022 on Personal Data Protection, Law Number 1 of 2024 on Electronic Information and Transactions, Government Regulation Number 71 of 2019 on Electronic Systems, Government Regulation Number 80 of 2019 on Electronic Commerce, and Minister of Trade Regulation Number 19 of 2026 on AI in electronic commerce [49]. Law Number 27 of 2022 provides important safeguards for lawful data processing and data subject rights, particularly through Articles 10, 20, and 21, while Article 47 of Minister of Trade Regulation Number 19 of 2026 introduces more specific requirements concerning AI responsibility, disclosure of AI-generated outputs, accuracy, risk-proportionate governance, and complaint mechanisms [50]. Together, these instruments support accountability, transparency, human oversight, data protection, digital rights, and risk-based regulation. However, their scopes remain fragmented. The Personal Data Protection Law primarily addresses personal data and does not comprehensively regulate algorithmic transparency, explainability, model validation, systemic risks, or responsibility for AI-generated outcomes beyond data processing. Similarly, an AI-based e-commerce system may simultaneously fall under personal data, electronic system, consumer protection, and AI-specific requirements, creating overlapping obligations while leaving gaps concerning general-purpose AI, model-level accountability, explainability standards, multi-actor responsibility, and high-impact AI applications outside specific sectors. The findings therefore suggest that Indonesia's main challenge is not the absence of legal protection but the lack of regulatory integration. A sustainable AI governance framework should consequently coordinate existing legal instruments and establish clearer lifecycle-based responsibilities to reduce regulatory uncertainty, avoid duplication, and address AI risks more consistently.

4.2. Core Principles of Sustainable AI Governance

The analysis identifies five interconnected principles for sustainable AI governance: accountability, transparency and explainability, human oversight, data protection and digital rights, and risk-based regulation. Accountability requires responsibility throughout the AI lifecycle, with duties assigned to developers, providers, deployers, business users, and decision-makers according to their roles, control, and contribution to risk, supported by documentation, impact assessment, auditability, monitoring, and remediation. Transparency and explainability should provide meaningful information about AI purposes, inputs, limitations, and consequences, with stronger requirements for higher-impact systems. Human oversight should enable competent individuals to review, intervene, override, and contest consequential AI decisions, while lower-risk applications may rely on monitoring and escalation mechanisms. Data protection and digital rights require lawful, necessary, and secure data governance while addressing discrimination, unfair treatment, and informational autonomy. Finally, risk-based regulation should apply proportionate obligations according to the likelihood and severity of harm, supporting adaptive and technology-neutral governance, as reflected in the EU AI Act and UNESCO principles. Together, these principles provide an integrated basis for responsible and sustainable AI governance, particularly in emerging digital economies such as Indonesia.

4.3. Integrated Legal Governance Framework for Sustainable Digital Business

Based on the normative analysis, this study proposes an integrated AI legal governance framework in which accountability, transparency and explainability, human oversight, data protection and digital rights, and

risk-based regulation operate as interconnected principles within a sustainability-oriented lifecycle. Sustainability serves as the overarching objective, linking human rights, institutional trust, and responsible innovation. The UNESCO Recommendation provides principles for human rights, accountability, transparency, oversight, data protection, fairness, and sustainability, while the EU AI Act demonstrates risk-based regulatory implementation. For Indonesia, these international principles should be selectively adapted to the national legal framework, regulatory structure, institutional capacity, enforcement resources, and digital maturity rather than directly transplanted.

4.4. Implications and Research Contribution

The findings emphasize the need for lifecycle-based and risk-sensitive AI governance for both digital businesses and policymakers. Businesses should integrate risk assessment, data governance, responsibility allocation, transparency, human oversight, monitoring, auditing, and remediation according to the potential impact of AI applications. Policymakers should strengthen regulatory coordination, technical guidance, reporting, supervision, and institutional capacity while applying proportionate requirements, particularly for smaller businesses. Indonesia faces challenges from fragmented regulatory authority, limited technical capacity, distributed responsibility, and compliance costs, making phased and coordinated implementation essential. The study contributes by integrating AI governance, digital business regulation, digital rights, and sustainability into a unified legal framework that supports accountability, transparency, human oversight, rights protection, and proportionate risk management. Overall, sustainable AI governance should balance innovation with human rights, accountability, institutional trust, and long-term resilience.

5. MANAGERIAL IMPLICATIONS

The findings suggest that managers should integrate AI governance into strategic business management rather than treating it solely as a technical or compliance function. Organizations should establish clear accountability across the AI lifecycle, conduct risk-based assessments, maintain meaningful transparency and explainability, and ensure human oversight for consequential automated decisions. Strong data governance should also be embedded into AI development to protect privacy, digital rights, and stakeholder interests. Managers should further align AI governance with long term sustainability by considering not only economic efficiency but also institutional trust, responsible innovation, stakeholder protection, and organizational resilience. Periodic AI audits, impact assessments, employee training, and regulatory monitoring can help organizations respond to evolving technological and legal risks. These practices can strengthen stakeholder confidence while enabling digital businesses to pursue innovation within a responsible and legally sustainable governance environment.

6. CONCLUSION

The rapid integration of AI into digital business ecosystems creates opportunities for innovation and efficiency while generating complex legal and governance challenges. This study, using a normative legal approach, finds that existing regulations on personal data protection, electronic transactions, and digital rights provide important foundations but remain fragmented in addressing increasingly autonomous, interconnected, and data-intensive AI activities. Sustainable AI governance therefore requires an integrated framework based on accountability, transparency and explainability, human oversight, data protection and digital rights, and risk-based regulation.

Sustainability should serve as an overarching objective of AI governance rather than an isolated regulatory requirement. Sustainable digital business ecosystems depend not only on technological and economic efficiency but also on institutional trust, human dignity, stakeholder protection, responsible innovation, and long-term resilience. The study contributes theoretically by integrating AI governance, digital business regulation, digital human rights, and sustainability within a unified framework, while practically providing guidance for policymakers and businesses to establish accountability structures, risk assessment mechanisms, transparency measures, human oversight, and effective data governance.

This study is subject to several limitations arising from its normative and doctrinal research design. Because the analysis focuses on legislation, legal principles, conceptual relationships, and comparative regulatory materials, it does not empirically measure how organizations implement AI governance requirements in

practice. The study therefore cannot determine the actual level of organizational compliance, the effectiveness of regulatory enforcement, the resources required by businesses to implement governance mechanisms, or the perceptions of affected stakeholders concerning transparency, human oversight, and contestability. The proposed framework should consequently be understood as a normative and conceptual governance model rather than an empirically validated implementation model. Future research should address these limitations through empirical studies examining organizational compliance with AI governance requirements, regulatory enforcement practices across relevant institutions, the experiences and perceptions of consumers and other affected stakeholders, and the effectiveness of human oversight and risk-based governance mechanisms across different sectors. Comparative empirical research across Southeast Asian jurisdictions could further examine whether different institutional capacities and regulatory architectures influence the effectiveness of AI governance. Such research would provide evidence for refining the proposed framework and assessing its practical effectiveness in sustainable digital business ecosystems.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: HH; Methodology: AA; Software: NL; Validation: NS, HH and OS; Formal Analysis: NS and NL; Investigation: AA; Resources: OS; Data Curation: NS and NL; Original Draft Preparation: AA and HH; Writing Review and Editing: NL, OS and HH; Visualization: NL; All authors, HH, NL, AA, NS, and OS, have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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7.7. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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