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Ethical Dimensions of Artificial Intelligence in the Digital Entrepreneurship Ecosystem: A Systematic Literature Review

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Abstract

The rapid adoption of artificial intelligence (AI) in digital entrepreneurship has created new opportunities for innovation, efficiency, and data-driven decision-making, while simultaneously raising ethical concerns related to fairness, transparency, privacy, accountability, and explainability. This study presents a systematic literature review to examine the ethical dimensions of AI within the digital entrepreneurship ecosystem. Guided by the PRISMA 2020 protocol and the PICO framework, searches were conducted across Web of Science, Scopus, and IEEE Xplore for studies published between 2020 and 2026. From 512 initially identified articles, 24 studies met the inclusion criteria and quality assessment requirements. The selected studies were analyzed using thematic coding, narrative synthesis, and quality-based evidence mapping to identify recurring ethical dimensions, operational mechanisms, and governance gaps. The findings reveal four dominant ethical problem clusters: algorithmic fairness in entrepreneurial decision-making, transparency deficits in black-box AI systems, data privacy and cybersecurity vulnerabilities, and weak accountability mechanisms in AI governance. The review further shows that responsible AI frameworks, explainability techniques, bias audits, data governance protocols, and risk-based regulatory approaches are central mechanisms for translating ethical principles into practice. The findings contribute to responsible AI scholarship, digital entrepreneurship governance, and policy-oriented debates by offering practical guidance for entrepreneurs, regulators, and researchers concerned with ethical AI adoption in resource-constrained business environments. This study provides an evidence-based roadmap for strengthening ethical, accountable, and socially responsible AI implementation in digital entrepreneurship ecosystems.

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I. INTRODUCTION

The penetration of artificial intelligence (AI) into entrepreneurial practices has progressed at a pace that exceeds the capacity of regulatory frameworks and the ethical preparedness of business actors. From machine learning–based customer sentiment analysis to autonomous dynamic pricing recommendation systems, AI has evolved into a core operational infrastructure supporting millions of enterprises worldwide (Uriarte & Huertas-Barros, 2026). These technologies enable firms to optimize decision-making processes, enhance efficiency, and respond to market dynamics with unprecedented speed and precision. However, beneath the promise of increased productivity and innovation lie a number of fundamental concerns related to values, fairness, transparency, and social accountability. In particular, the opacity of algorithmic decision-making and the potential for embedded bias raise critical questions about the ethical implications of AI deployment in business contexts, necessitating more robust governance and interdisciplinary scrutiny.

The first issue most frequently documented in the literature is the presence of systematic bias in algorithmic decision-making processes. When historical data often reflecting entrenched social and economic inequalities are used to train predictive models, AI systems may inadvertently reproduce and even amplify existing patterns of discrimination (Mehrabi et al., 2022). This occurs because machine learning models are inherently dependent on the quality and representativeness of their training data; consequently, any biases embedded within the data are likely to be encoded into the system's outputs.

In the context of entrepreneurship, such biases can have significant and far-reaching implications. For instance, they may influence hiring decisions by favoring certain demographic groups over others, thereby undermining principles of equal opportunity. Similarly, AI-driven credit scoring systems can disadvantage small and medium-sized enterprise (SME) owners particularly those from marginalized backgrounds by systematically underestimating their creditworthiness. Furthermore, the use of dynamic pricing algorithms may result in differential pricing strategies that disproportionately affect specific consumer segments, raising concerns about fairness and market ethics (López et al., 2026). Collectively, these issues highlight the urgent need for greater transparency, bias mitigation strategies, and ethical oversight in the deployment of AI technologies within entrepreneurial ecosystems.

The second issue concerns a deficit of transparency in AI systems. Most contemporary machine learning models particularly those based on complex architectures such as deep learning operate in ways that are difficult to interpret or explain to end users, stakeholders, and even regulators, thereby creating significant information asymmetries that may disadvantage consumers, obscure accountability, and hinder effective public oversight (Arrieta et al., 2020). As a result, individuals and institutions affected by algorithmic decisions often lack the necessary insight to understand how and why such decisions are made. In response to these challenges, the concept of explainability has emerged as a critical component of responsible AI governance, referring to the capacity of a system to provide clear, interpretable justifications for its outputs and decision-making processes. This capability is increasingly recognized as an ethical prerequisite for the deployment of AI, particularly in high-stakes domains such as finance and human resource management, where algorithmic decisions can have profound consequences for individuals' livelihoods and access to opportunities. Enhancing transparency through explainable AI not only promotes fairness and trust but also facilitates regulatory compliance and more informed stakeholder engagement.

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Meanwhile, the dimensions of data privacy and cybersecurity have attracted increasing attention in parallel with the growing volume of data collected, processed, and monetized by AI-driven platforms. Entrepreneurs who rely on consumer data as a strategic asset face a dual pressure: on the one hand, they seek to maximize the predictive and economic value of data through advanced analytics, while on the other hand, they are bound by legal obligations and ethical responsibilities to safeguard individual privacy rights (Huseynov & Nematova, 2026). This tension is further complicated by the rapid evolution of data-driven business models, which often outpace the development of regulatory frameworks and enforcement mechanisms. As a result, businesses must navigate a complex landscape of compliance requirements, reputational risks, and technological vulnerabilities. The challenge is particularly pronounced in developing countries, where data protection regulations are still in formative stages and institutional capacities for oversight remain limited. Consequently, the absence of harmonized standards and robust governance structures exacerbates uncertainty, making it difficult to balance innovation with the protection of fundamental rights in the digital economy. Although prior studies have extensively examined AI ethics in broad organizational, technological, and regulatory settings, there remains limited systematic evidence on how ethical principles are translated into operational mechanisms within entrepreneurial ecosystems. Existing studies often discuss fairness, transparency, privacy, accountability, and explainability as normative ideals, but they provide insufficient synthesis of how these principles are implemented by startups, SMEs, and digital entrepreneurs with limited technical, financial, and regulatory capacity. This gap is particularly important because entrepreneurial actors often adopt AI under conditions of resource constraint, regulatory uncertainty, and limited access to specialized technical expertise. Therefore, a systematic synthesis is needed to clarify not only what ethical AI principles are relevant, but also how they can be operationalized through concrete governance, evaluation, and accountability practices in digital entrepreneurship.

Table 1. Mapping of Research Questions

RQ Code	Research Question Focus	Analytical Dimension	Exploratory Objective
RQ1	How are AI models integrated into strategic decision-making processes in entrepreneurship?	Technology Integration & Strategy	To identify patterns, approaches, and the role of AI in supporting strategic business decisions
RQ2	What are the most significant ethical challenges faced by entrepreneurs in the adoption of AI?	Ethics & Risk	To examine issues such as algorithmic bias, transparency, privacy, and accountability in AI usage
RQ3	Which ethical frameworks and principles have proven effective in managing AI-related risks within business environments?	Governance & Ethical Frameworks	To evaluate the effectiveness of frameworks such as fairness, accountability, transparency, and explainability
RQ4	How are methods for the evaluation and validation of AI systems implemented in entrepreneurial contexts?	System Evaluation & Validation	To identify technical and methodological approaches ensuring AI reliability and performance

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RQ5	What are the social, economic, and policy implications of AI adoption within entrepreneurial ecosystems?	Multidimensional Impact	To analyze macro- and micro-level consequences for society, markets, and regulatory environments

Table 1 shows that the research questions are structured to move from technological integration to ethical risk, governance frameworks, validation practices, and broader socio-economic implications. This structure allows the review to examine AI ethics not merely as an abstract normative issue, but as a set of operational challenges embedded in entrepreneurial decision-making, business model innovation, and stakeholder governance. By organizing the review in this sequence, the study connects the technical adoption of AI with the ethical, organizational, and policy mechanisms required to ensure responsible implementation in digital entrepreneurship ecosystems.

II. LITERATURE

Academic discourse on the ethics of artificial intelligence (AI) in entrepreneurship has accelerated significantly since 2020, driven by the widespread adoption of generative models and predictive systems across business ecosystems. As organizations increasingly integrate AI into core operational and strategic functions, scholarly attention has shifted toward examining the ethical implications of such technologies in entrepreneurial contexts. In their seminal meta-analysis of 84 AI ethics guidelines, Jobin et al. (2019) identified five principles that most consistently recur across frameworks: transparency, fairness, non-maleficence, responsibility, and privacy. These principles have since emerged as a dominant normative foundation in subsequent literature, informing both theoretical debates and practical governance approaches. Moreover, they serve as a conceptual baseline for evaluating the ethical alignment of AI systems, guiding entrepreneurs, policymakers, and researchers in navigating the complex interplay between technological innovation and societal values.

From an entrepreneurial perspective, Hmieleski and Lerner (2023) argue that the ethical orientation of entrepreneurs directly moderates how they perceive and respond to algorithmic risks in the development of products and services. Entrepreneurs with a strong ethical commitment are more likely to adopt precautionary measures, integrate fairness considerations into design processes, and prioritize long-term stakeholder trust over short-term gains. Conversely, those with a weaker ethical orientation may be more inclined to overlook or underestimate the potential harms associated with biased or opaque AI systems. Complementing this view, Floridi et al. (2021), through their influential “AI for People” framework, emphasize that trustworthy AI must satisfy a set of foundational conditions, namely that it should be lawful, ethical, and technically robust. This triadic framework is particularly relevant for entrepreneurs operating across diverse regulatory environments, as it underscores the need to balance legal compliance, moral responsibility, and system reliability in the deployment of AI-driven innovations.

At the regional level, literature from Southeast Asia indicates that cultural and institutional contexts play a significant role in shaping perceptions of AI ethics. Comparative research by Kamil et al. (2025) demonstrates that, within the framework of Islamic business ethics, principles such as honesty, trustworthiness and transparency, and accountability in communication can serve as a robust normative foundation for the development and deployment of ethical AI in Muslim-majority markets. These values not only guide individual entrepreneurial conduct but also influence organizational governance and stakeholder expectations in technology adoption.

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Furthermore, the integration of such context-specific ethical principles highlights the importance of aligning AI systems with locally embedded moral frameworks, rather than relying solely on universalized standards. This perspective opens new avenues for research into ethical pluralism in AI, challenging a discourse that has thus far been largely dominated by Western-centric viewpoints and encouraging a more inclusive, globally representative understanding of responsible AI development.

Nevertheless, Mittelstadt et al. (2022) caution that most existing AI ethics frameworks remain largely declarative rather than operational; while they are effective in identifying and articulating key ethical concerns, they often fail to provide concrete mechanisms or actionable guidance for resolving them in practice. This limitation creates a persistent gap between abstract ethical principles and their real-world implementation, particularly in dynamic and resource-constrained entrepreneurial environments where practical decision-making tools are essential. As a result, organizations may struggle to translate high-level commitments to fairness, transparency, and accountability into measurable practices, governance structures, and technical safeguards. Addressing this disconnect has therefore become a central motivation for more focused systematic literature reviews that emphasize the implementation dimension, seeking to identify not only what ethical AI should entail but also how it can be effectively operationalized across diverse business contexts.

III. RESEARCH METHOD

This study employs a Systematic Literature Review (SLR) design guided by the PRISMA 2020 framework (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), as established by Page et al. (2021). The selection of this methodological approach is grounded in its capacity to produce a transparent, rigorous, and reproducible synthesis of evidence, thereby minimizing selection bias that often characterizes conventional narrative reviews. By adhering to standardized reporting protocols, the PRISMA framework enhances the clarity and reliability of the review process, from study identification to inclusion and analysis. Furthermore, the PICO framework (Population, Intervention, Comparison, Outcome) is utilized to systematically operationalize the research questions into a structured search strategy, enabling the identification of relevant studies with greater precision and consistency. This combined methodological approach ensures that the review not only captures the breadth of existing literature but also maintains analytical depth and methodological integrity in examining the ethical dimensions of AI in entrepreneurship.

The scope of this study encompasses empirical research, case studies, and conceptual analyses that explicitly examine the intersection between AI ethics and entrepreneurial practices within the context of the digital economy. By integrating multiple types of scholarly contributions, the review aims to capture both theoretical developments and real-world applications of ethical AI in business settings. The population of interest includes entrepreneurs, startups, small and medium-sized enterprises (SMEs), and organizations that adopt AI as a tool for business decision-making. These entities are particularly relevant due to their increasing reliance on data-driven technologies to enhance competitiveness, efficiency, and innovation. Additionally, focusing on this population allows the study to explore how ethical considerations are operationalized across different organizational scales and levels of technological maturity, thereby providing a more comprehensive understanding of the challenges and opportunities associated with responsible AI adoption in entrepreneurial ecosystems.

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The systematic search was conducted across three academic databases: Web of Science (WoS), Scopus, and IEEE Xplore. The selection of these databases was informed by the complementarity of their coverage, with WoS and Scopus providing strong representation in management, business, and social science journals, while IEEE Xplore enhances access to literature in technical and computational domains. This combination ensures a more comprehensive and interdisciplinary retrieval of relevant studies at the intersection of AI, ethics, and entrepreneurship. To maintain relevance and reflect recent developments in the field, the search was to articles published 2020 and 2026, a period marked by rapid advancements in AI technologies and their widespread adoption in business contexts. Additionally, only publications in English and Indonesian were included, enabling the review to capture both global perspectives and regionally specific insights, particularly from emerging digital economies.

The search syntax employed in this study was defined as follows: ((“artificial intelligence” OR “machine learning” OR “deep learning” OR “generative AI”) AND (“entrepreneurship” OR “startup” OR “SME” OR “digital business”) AND (“ethics” OR “fairness” OR “bias” OR “accountability” OR “transparency” OR “explainability”)). This Boolean search string was carefully constructed to capture the multidimensional nature of the research topic, integrating key technological, entrepreneurial, and ethical dimensions into a unified query framework. To ensure a high level of topical relevance and precision, the search was to the title, abstract, and keyword fields of each database entry, thereby reducing the inclusion of peripheral or unrelated studies. This targeted approach enhances the specificity of the retrieved literature while maintaining sufficient breadth to encompass diverse perspectives within the field. Moreover, the use of multiple synonymous terms and closely related concepts helps mitigate the risk of overlooking relevant publications that may employ different terminologies across disciplines. Table 2 presents a comprehensive overview of the criteria used to screen and select articles deemed eligible for analysis.

Table 2. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Articles that examine the implementation of AI in entrepreneurial or digital business contexts with an explicit ethical dimension.	Articles that do not address AI or lack an ethical dimension relevant to entrepreneurship.
Empirical studies (quantitative or qualitative) or experimental research with real-world validation in business environments.	Editorial opinions, brief commentaries, or conference papers without sufficient empirical data.
Published in English or Indonesian between 2020 and 2026 in indexed journals.	Published before 2020, in languages other than English or Indonesian, or not yet in final publication form.
Address at least one of the following dimensions: fairness, transparency, privacy, or AI accountability.	Articles that focus solely on the technical aspects of AI without ethical or social implications.

Each article that passed the eligibility stage was evaluated using a Quality Assessment Checklist consisting of eight criteria (QA1–QA8), with a scoring scale ranging from 0 to 2. A score of 2 indicates full compliance, a score of 1 indicates partial compliance, and a score of 0 indicates non-compliance. The assessment criteria include: (QA1) relevance to the domain of AI ethics in entrepreneurship; (QA2) methodological quality and internal validity; (QA3) completeness of data description and sources; (QA4) the presence of temporal validation mechanisms; (QA5) discussion of potential feature leakage and its mitigation; (QA6) the use of

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measurable fairness metrics; (QA7) the application of model interpretability techniques; and (QA8) the testing of AI system robustness.

Table 3. Inclusion and Exclusion Criteria

No	QA1	QA2	QA3	QA4	QA5	QA6	QA7	QA8	Total
1	2	2	2	2	1	2	2	2	15
2	2	2	2	1	1	2	1	1	12
3	2	2	2	1	1	2	2	2	14
4	2	2	2	1	1	2	1	1	12
5	2	2	2	1	1	2	1	2	13
6	2	2	2	2	1	2	1	1	13
7	2	2	2	1	1	2	1	1	12
8	2	2	2	1	1	2	1	1	12
9	2	2	2	1	1	2	1	1	12
10	2	2	2	2	1	2	1	1	13
11	2	2	2	1	1	1	2	2	13
12	2	2	2	1	2	2	2	2	15
13	2	2	1	2	1	1	1	2	12
14	2	2	2	2	1	1	2	1	13
15	2	2	2	1	1	2	1	2	13
16	2	2	1	1	1	2	1	1	11
17	2	2	1	1	1	2	1	2	12
18	2	2	2	1	2	2	1	2	14
19	2	2	1	1	1	2	1	2	12
20	2	2	1	1	1	2	1	2	12
21	2	2	2	1	1	2	1	1	12
22	2	2	2	1	1	2	1	2	13
23	2	2	1	2	2	1	1	2	13
24	2	2	2	1	1	2	1	2	13

A hard exclusion mechanism was implemented to ensure the rigor and relevance of the selected studies. Specifically, any article receiving a score of 0 on QA1 (domain relevance to AI ethics and entrepreneurship), QA2 (methodological quality and internal validity), or QA7 (application of model interpretability techniques) was automatically excluded from the corpus, as deficiencies in these core criteria were deemed critical. In addition to this threshold, articles were further categorized based on their total quality assessment scores. Studies achieving a cumulative score of ≥ 14 were classified as Include (Core), indicating high methodological robustness and strong relevance to the research objectives. Those with scores ranging from 11 to 13 were categorized as Include (Supporting), reflecting moderate quality and supplementary value to the analysis. Conversely, articles with total scores below 11 were excluded due to insufficient quality or relevance. This tiered evaluation approach enhances the reliability of the review by prioritizing high-quality evidence while still incorporating supporting insights where appropriate.

Out of 512 articles initially identified through database searches, the deduplication process eliminated 287 records that appeared in more than one database. From the remaining 225 unique articles, 52 were excluded the screening stage based on their titles and abstracts, as they did not meet the core topical criteria. Further screening resulted in 173 articles that satisfied the initial

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inclusion criteria; however, 65 of these were subsequently excluded full-text review due to methodological inconsistencies or limited accessibility. During the quality assessment stage, 112 articles were evaluated, of which 88 were excluded based on the predefined criteria. Consequently, a final set of 24 articles was retained and included in the synthesis analysis.

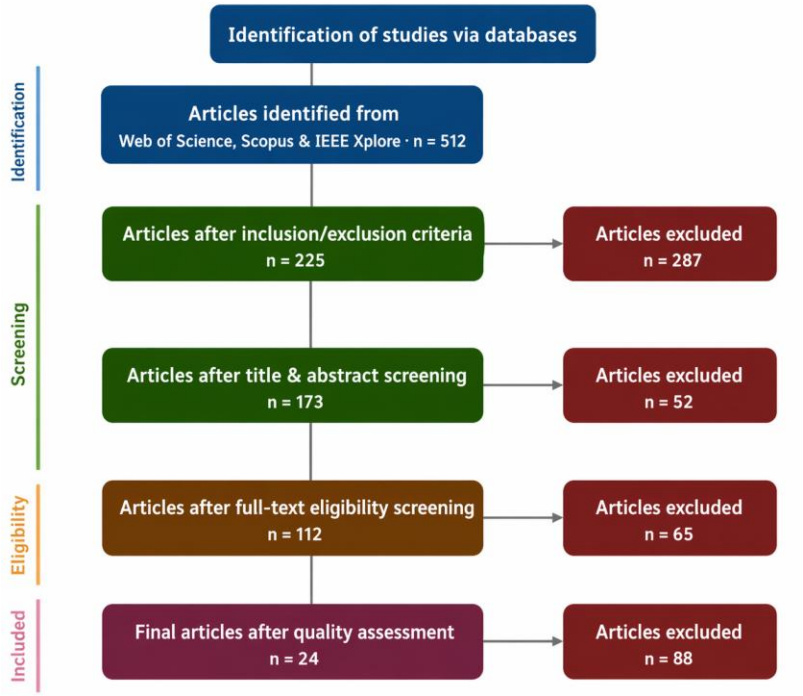

Figure 1. Flowchart PRISMA

IV. RESULTS AND DISCUSSION

This section presents the synthesized findings derived from the 24 selected articles, structured in accordance with the five research questions guiding this study. The analysis is conducted using a comparative approach to systematically identify recurring patterns, key divergences, and emerging themes across the reviewed literature. In addition to mapping these patterns, the synthesis also seeks to uncover existing gaps and underexplored areas that warrant further scholarly attention. Furthermore, particular emphasis is placed on highlighting the theoretical contributions of the selected studies, including how they advance current understandings of AI ethics within entrepreneurial contexts. Through this integrative analysis, the section aims to provide a coherent and comprehensive overview of the state of the art while also offering insights into future research directions and practical implications.

RQ1: How are AI models integrated into strategic decision-making processes in entrepreneurship?

The findings indicate that the most widely applied AI models in entrepreneurial decision-making are supervised learning techniques for classification and prediction tasks, accounting for 62% of the reviewed studies. These are followed by natural language processing (NLP) methods, which constitute 24% of the studies and are primarily used for sentiment analysis and customer communication, as well as reinforcement learning approaches, representing 14%, which are typically employed for dynamic pricing optimization and supply chain management. This distribution reflects a strong emphasis on predictive analytics and data-driven decision support

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within entrepreneurial contexts. In terms of application domains, the literature most frequently examines areas such as financial risk management and credit assessment for small and medium-sized enterprises (SMEs), recruitment and human resource management processes, real-time demand-based dynamic pricing strategies, and personalized marketing driven by consumer behavior analytics. Collectively, these applications illustrate the growing integration of AI technologies into core business functions, enabling entrepreneurs to enhance efficiency, responsiveness, and strategic decision-making in increasingly competitive digital markets.

Interestingly, a study by Cristofaro et al. (2026) demonstrates that entrepreneurs achieve the greatest effectiveness when AI is used not as a substitute for human judgment, but as an augmentative tool. In this role, AI enhances analytical capacity while allowing entrepreneurs to retain contextual awareness and nuanced decision-making that machines cannot replicate. This finding highlights the importance of adopting a human-in-the-loop paradigm in the design and implementation of AI systems within entrepreneurial settings.

RQ2: What are the most significant ethical challenges faced by entrepreneurs in the adoption of AI?

Four major categories of ethical challenges are consistently identified across the reviewed studies. First, algorithmic bias emerges as the most frequently reported issue, appearing in 79% of the articles. This bias is not always intentional; rather, it can arise from imbalanced representation in training data, the selection of non-neutral features, or the optimization of objective functions that neglect dimensions of distributive fairness. In the context of AI-based recruitment, for example, Ibrahim et al. (2024) document that algorithms exhibit discriminatory patterns based on attributes such as skin color, gender, and age, even when these attributes are explicitly excluded from the input variables.

Second, issues of transparency and explainability constitute a significant barrier to institutional trust. When AI systems generate decisions with substantial consequences—such as loan rejections or employee terminations the inability to clearly explain the reasoning behind these outcomes can lead to distrust and potential legal challenges. Balasubramaniam et al. (2023) observe that explainability requirements embedded in regulations such as the European Union's GDPR, particularly the "right to explanation," have not been consistently translated into technical practices within organizations. This gap highlights the ongoing tension between regulatory expectations and practical implementation.

Third, data privacy and cybersecurity have become increasingly critical dimensions as the use of sensitive consumer data continues to expand. Organizations are required to balance the strategic value of data with the obligation to protect individual privacy and ensure secure data management practices. Huseynov and Nematova (2026) propose a multi-layered AI governance model that differentiates responsibilities at the business, corporate, national, and global levels, reflecting the jurisdictional complexity of cross-border data management. This approach underscores the need for coordinated governance structures capable of addressing evolving risks in the digital economy.

Fourth, a structural accountability deficit represents a relatively underexplored yet highly significant challenge from a governance perspective. Existing enterprise risk management systems are generally not designed to address the specific ethical risks associated with AI technologies. As a result, ethical violations often remain undetected until tangible harm has already occurred. McGrath et al. (2024) find that this lack of proactive accountability mechanisms limits organizations' ability to anticipate and mitigate AI-related risks, emphasizing the need for more robust and forward-looking governance frameworks.

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RQ3: Which ethical frameworks and principles have proven effective in managing AI-related risks within business environments?

From the 24 articles analyzed, three ethical frameworks receive the strongest empirical support. First, the Responsible AI Framework, originally developed by Microsoft and subsequently adapted by various academic institutions, emphasizes six core principles: fairness, reliability and safety, privacy and security, inclusiveness, transparency, and accountability. This framework serves as the dominant normative reference in 43% of the reviewed studies, reflecting its broad applicability across both technical and organizational contexts. Its structured yet flexible design allows organizations to operationalize ethical principles in a systematic and scalable manner.

Second, the Value-Sensitive Design (VSD) approach, which integrates ethical values from the earliest stages of system development, has been shown to be more effective than retrospective approaches that attempt to impose ethical safeguards after system deployment. By embedding moral considerations into the design process itself, VSD enables a more proactive and context-aware alignment between technology and human values. Bogdanova (2025) demonstrates that AI-based entrepreneurship curricula incorporating VSD principles produce graduates with more advanced ethical reasoning and decision-making capacities compared to those trained in conventional programs. This finding underscores the importance of education and early-stage design in shaping responsible AI practices.

Third, risk-based regulatory approaches, such as those implemented in the European Union's AI Act, have proven to be more adaptive than rigid, rule-based regulatory models. These frameworks classify AI systems according to their level of risk and apply proportionate requirements accordingly, thereby balancing innovation with protection. Saqib and Amin (2026), in a comparative study of fintech regulation, find that risk-based frameworks enable continued technological advancement while simultaneously providing safeguards against potential harm. This adaptability makes them particularly suitable for rapidly evolving sectors where static regulations may quickly become obsolete.

RQ4: How are methods for the evaluation and validation of AI systems implemented in entrepreneurial contexts?

Practices for evaluating AI models in the entrepreneurship literature remain largely dominated by conventional metrics such as accuracy, precision, and recall, which focus primarily on predictive performance without adequately accounting for fairness considerations. While these metrics are essential for assessing technical effectiveness, they provide limited insight into the ethical implications of model outputs. Notably, only 31% of the reviewed studies explicitly incorporate fairness metrics such as demographic parity, equalized odds, or individual fairness into their evaluation protocols. This gap indicates that ethical evaluation remains a secondary concern in many applied entrepreneurial contexts, despite its growing importance.

Model interpretability techniques, particularly SHAP (SHapley Additive exPlanations) and LIME (Local Interpretable Model-agnostic Explanations), are increasingly being adopted to enhance transparency in AI systems. However, their implementation remains inconsistent across studies. Only 28% of the reviewed articles integrate interpretability techniques into routine evaluation processes, the majority employ them in an ad hoc or supplementary manner rather than as a standard practice. To address this fragmentation, Huang et al. (2026) propose a data governance framework that embeds continuous ethical evaluation throughout the entire data lifecycle, offering a more systematic and sustainable approach to aligning technical performance with ethical accountability.

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RQ5: What are the social, economic, and policy implications of AI adoption within entrepreneurial ecosystems?

Artificial intelligence (AI) holds the potential to function both as a tool for economic democratization and as an amplifier of existing inequalities, depending on how it is designed, deployed, and governed. On the one hand, Ganuthula and Indian (2025) demonstrate that AI enables individual entrepreneurs to access analytical capabilities that were previously available only to large corporations, thereby significantly lowering barriers to entry in competitive markets. This phenomenon is described as the "democratization of AI-driven entrepreneurship," as it empowers smaller actors to compete more effectively through data-driven insights. Consequently, AI can foster innovation, inclusivity, and broader participation in the digital economy.

On the other hand, in the absence of adequate governance frameworks, AI can exacerbate structural inequalities. Irawan et al. (2025) document that in Indonesia, the unregulated use of AI has the potential to widen the gap between large enterprises, which possess the resources to adopt advanced technologies, and small and medium-sized enterprises (SMEs), which often remain constrained by limited digital infrastructure. This disparity not only affects market competitiveness but also reinforces existing socio-economic divides. Without targeted interventions, the benefits of AI adoption may remain unevenly distributed, favoring already advantaged actors.

From a policy perspective, the reviewed studies consistently recommend several key measures to address these challenges. These include: (1) the development of independently verifiable algorithmic auditing standards to ensure accountability and transparency; (2) mandatory disclosure requirements for companies that utilize AI in decisions with significant impacts on consumers or employees; (3) increased investment in digital literacy and AI ethics as integral components of formal entrepreneurship education; and (4) the establishment of multi-stakeholder oversight bodies that include representation from communities most vulnerable to the adverse effects of AI systems. Collectively, these recommendations aim to balance innovation with equity and to promote more inclusive and responsible AI governance.

V. CONCLUSION

This systematic literature review mapped the ethical dimensions of artificial intelligence (AI) within the digital entrepreneurship ecosystem by synthesizing 24 selected studies from an initial pool of 512 articles. The findings show that AI adoption in entrepreneurial contexts generates multidimensional ethical challenges that cannot be addressed solely through technical optimization. The dominant ethical dimensions identified in this review include algorithmic fairness, transparency and explainability, data privacy and security, and structural accountability. These dimensions are closely interconnected because bias mitigation, model interpretability, data protection, and governance responsibility often operate simultaneously within AI-enabled entrepreneurial decision-making, business model innovation, and stakeholder relations.

A key limitation in the existing literature is the frequent conflation between ethical principles and operational mechanisms. Ethical principles refer to normative commitments such as fairness, transparency, privacy, accountability, explainability, and non-maleficence. By contrast, operational mechanisms refer to measurable or implementable practices through which these principles are translated into technical and organizational procedures. These mechanisms include bias audits, explainability techniques, data governance protocols, post-deployment monitoring, accountability reporting, stakeholder oversight, and risk-based regulatory assessment. This

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distinction is essential because ethical AI in digital entrepreneurship cannot be achieved merely by endorsing abstract values; it requires concrete procedures that can be implemented, evaluated, and continuously improved in real business environments.

Theoretically, this study contributes to the literature on Responsible AI, AI governance, and digital entrepreneurship by clarifying how ethical principles can be operationalized within resource-constrained entrepreneurial ecosystems. Rather than treating fairness, transparency, privacy, and accountability as abstract concepts, the review demonstrates how these principles can be translated into measurable practices that support responsible AI adoption. Practically, the findings provide guidance for entrepreneurs, SMEs, regulators, educators, and researchers in designing AI adoption strategies that are technically effective, ethically accountable, socially inclusive, and contextually appropriate. The study also contributes to policy-oriented debates by emphasizing the need for algorithmic auditing standards, mandatory transparency requirements, AI ethics education, and multi-stakeholder oversight mechanisms.

Despite its contributions, this study has several limitations. The review was limited to three major academic databases, namely Web of Science, Scopus, and IEEE Xplore, which may have excluded relevant studies from regional journals, practitioner reports, policy documents, and grey literature. In addition, the methodological heterogeneity of the reviewed studies limited the possibility of conducting a quantitative meta-analysis. Future research should therefore expand the evidence base by incorporating broader data sources, comparative regional studies, longitudinal case studies, and empirical evaluations of Responsible AI mechanisms in startups, SMEs, and digital business platforms. Such research is necessary to strengthen the practical translation of AI ethics from normative principles into operational governance within digital entrepreneurship ecosystems.

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