

## Strengthening Ethical Artificial Intelligence Based on Behavioral Economics through the Principles of Trust, 'Adl, and Ihsan in Decision Making: A Literature Review

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### ABSTRACT

This research aims to strengthen the framework of Ethical Artificial Intelligence based on behavioral economics through the integration of the principles of Amanah, 'Adl, and Ihsan in decision-making. The research background is grounded in the increasing use of artificial intelligence in decision-making, which is vulnerable to cognitive bias, while the existing literature remains dominated by technical and procedural approaches to addressing ethical issues. The research employed a conceptual literature review of 17 journal articles on behavioral economics, artificial intelligence, cognitive bias, nudging, and moral decision-making. Analysis is conducted through data extraction, thematic coding, and conceptual synthesis to map the state of the art in research, identify normative gaps, and develop an alternative, value-based framework. The results show that the integration of behavioral economics and artificial intelligence has evolved to explain and manage cognitive biases, but has not yet been systematically integrated into a substantive normative value framework. Ethics in AI systems is still understood procedurally and is not yet oriented toward substantive justice, trust, and social usefulness. This study concludes that the principles of Amanah, 'Adl, and Ihsan can be positioned as alternative conceptual frameworks to strengthen ethical artificial intelligence approaches that are more just, responsible, and socially beneficial.



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## 1. Introduction

The Development of behavioral economics has shifted the dominant paradigm in economics and decision-making from the assumption of full rationality to the recognition of human cognitive, emotional, and social limitations. Various studies show that individuals, whether as consumers, managers, investors, or policymakers, are systematically influenced by cognitive biases such as loss aversion, anchoring, status quo bias, overconfidence, and hyperbolic discounting in their decision-making. (Amehmed & Etbiga, 2023; Hasan et al., 2025; Onoriode, 2025). The findings confirm that deviations from rationality are not anomalies, but rather patterns of behavior that can be predicted and replicated across contexts. Within this theoretical framework, behavioral economics plays a significant role in explaining why human decision-making often deviates from optimality, even when sufficient information is available. However, the behavioral economics literature has historically emphasized the descriptive and diagnostic dimensions of identifying and measuring bias, rather than formulating normative principles for the ethical management of such biases. These limitations become increasingly problematic when behavioral economics insights are widely adopted in

digital systems and innovative technologies. As a result, there is an urgent need to align the empirical understanding of cognitive bias with a more transparent and more functional ethical framework..

As technological advances continue, the integration of behavioral economics and artificial intelligence (AI) is emerging as a primary focus of contemporary research. AI is widely recognized for its potential to help humans overcome cognitive limitations through predictive analytics, risk modeling, and complex data processing that exceed human capacity (Ramon & Rita, 2025). Numerous studies show that AI-based algorithms can detect and mitigate biases, such as overconfidence, confirmation bias, and loss aversion, in managerial, entrepreneurial, and market decision-making contexts (Ramon & Rita, 2025). In digital marketing, applying behavioral economics principles through AI-enabled digital nudging has been shown to influence user attention and behavior. However, the effects are often transient and not always sustainable (Vardikou et al., 2025). However, the literature consistently acknowledges that AI is not value-free and can reproduce or even reinforce bias when trained on unfair data or designed for efficiency alone. Thus, although the integration of AI and behavioral economics has reached a certain level of methodological maturity, its normative dimension is still limited to general principles such as transparency and accountability, without a systematically integrated substantive value framework.

Normative limitations in the literature become increasingly evident when behavioral insights are used to influence vulnerable groups and contexts with high information asymmetry. Classical studies of the poor are no more irrational than other groups, but face the heavier consequences of cognitive bias due to situational pressures and limited resources. (Bertrand et al., 2006). These empirical results support the assertion that choice architecture, default alternatives, and contextual framing exert substantial influence on the Wellbeing of marginalized populations. However, although the literature is rich in psychology-based policy recommendations, the discussion of the ethics of behavioral intervention remains implicit and lacks a normative structure. Similar is also found in the marketing and management literature, where nudging and persuasion are often judged based on short-term effectiveness, rather than moral legitimacy or long-term social impact (Rubinson, 2010; Vardikou et al., 2025). This condition reflects a gap between the understanding of how human decisions are shaped and the normative question of how intelligent systems should mediate the process fairly and morally. As a result, the imperative for an ethical artificial intelligence framework that is not only aware of bias but also fundamentally guided by values is growing.

In this context, this research departs from the criticism that the literature on behavioral economics and ethical AI remains dominated by technocratic approaches that treat ethics as a complement rather than a foundation. Although various behavioral models have been developed with mathematical precision and strong empirical validation, such as reference dependence, social preferences, and hyperbolic discounting (Ho et al., 2006) Such models have not been systematically linked to the normative value principles that guide the design and implementation of AI systems. Similarly, studies on creativity and innovation show that, without value guidance, technology-based innovation can be exploitative and does not always yield social benefits. (Neto et al., 2011). The existing ethical AI literature tends to treat the concepts of fairness, transparency, and accountability as procedural, without linking them to deeper substantive values. As a result, there is a conceptual gap between "what happens" in decision-making behavior and "what should be done" by the AI system that mediates that behavior. This will be the primary focus of this study.

Based on this background, this research aims to strengthen the framework of Ethical Artificial Intelligence based on behavioral economics through the integration of the values of Amanah, 'Adl, and Ihsan. Amanah is positioned as a foundation of trust and responsibility in data management, algorithm design, and the use of AI outputs, beyond just technical transparency. The 'Adl principle provides a dimension of substantive justice to assess whether AI systems and the choice architecture they produce are truly fair to various social groups and do not exploit cognitive bias. Meanwhile, Ihsan emphasized moral superiority and social usefulness, so that AI evaluation does not stop at minimizing losses, but also on long-term positive contributions to human Well-being. Using a conceptual literature review, this study synthesizes key findings from behavioral economics, AI, and ethics to develop an integrated alternative normative framework. Therefore, this study is not intended to validate the hypothesis empirically, but rather to develop a more coherent and prescriptive framework.

In line with this, the problem formulation is presented as a question. First, how is the Development of state-of-the-art research that integrates behavioral economics and artificial intelligence used to explain,

detect, and manage cognitive biases in decision-making? This question aims to map the scientific landscape and trends in the latest research in the literature. Second, what are the limitations and conceptual gaps in the behavioral economics and ethical AI literature related to the integration of normative value frameworks in the design and implementation of AI-based decision-making systems? This question, which seeks to fill a theoretical void, has not existed before. Third, how can the values of Amanah, 'Adl, and Ihsan be positioned as an alternative conceptual framework to strengthen the behavioral economics approach in the Development of ethical artificial intelligence oriented towards justice, trust, and social benefit? By answering these three questions, this research is anticipated to make a substantial theoretical contribution to the advancement of Ethical AI, characterized not only by intelligence and efficiency but also by morality and contextual relevance.

## 2. Research Methods

This study uses a conceptual and systematic literature review design to synthesize the Development of state-of-the-art, identifying normative gaps, and building an alternative conceptual framework in the Development of Ethical Artificial Intelligence based on behavioral economics. The research sample comprises 17 scientific journal articles purposively selected from the literature you have collected, including conceptual studies, systematic literature reviews, integrative reviews, and experimental and applied research in the fields of behavioral economics, artificial intelligence, digital nudging, decision-making, and behavioral ethics. The articles represent a wide range of contexts, including management, marketing, entrepreneurship, consumer decision-making, as well as vulnerable groups, as shown in the work (Amehmed & Etbiga, 2023; Bertrand et al., 2006; Hasan et al., 2025; Ho et al., 2006; Neto et al., 2011; Onoriode, 2025; Ramon & Rita, 2025; Rubinson, 2010; Vardikou et al., 2025). The research instruments used were literature data extraction sheets, compiled to systematically identify the research focus, theoretical framework, types of cognitive biases discussed, the role of AI in the detection or mitigation of bias, the ethical dimensions employed, and the conceptual limitations recognized by each study. Data collection is conducted through close reading of each article, followed by thematic coding of key concepts such as loss aversion, anchoring, nudging, fairness, trust, transparency, and the ethical implications of AI use.

The analysis methods used are thematic analysis and conceptual synthesis, where the findings of the literature are grouped into three layers of analysis: mapping of the state of the art integration of behavioral economics and AI, identification of normative research gaps in ethical AI, and reconstruction of conceptual frameworks based on the principles of Amanah, 'Adl, and Ihsan. Through this synthesis process, the research does not compare results statistically but instead interprets the conceptual linkages and tensions among studies to produce coherent and replicable theoretical contributions. This approach ensures that other researchers can replicate the methodology by using a similar corpus of literature and transparent analytical procedures.

## 3. Results

All of the articles reviewed consistently place behavioral economics as the primary foundation for explaining deviations from classical rationality assumptions in decision-making. The most common cognitive biases in the literature include loss aversion, anchoring, status quo bias, confirmation bias, overconfidence, hyperbolic discounting, and framing effects as reported by (Amehmed & Etbiga, 2023; Hasan et al., 2025; Ho et al., 2006; Onoriode, 2025). The aforementioned studies make it clear that cognitive bias is not merely a stochastic phenomenon; instead, it exhibits systematic and predictable patterns across various decision-making frameworks. Empirical evidence suggests that such bias manifests in both non-expert individuals and professional agents, including managers and investors. Furthermore, the scientific literature shows that emotional states, social pressures, and inherent cognitive and situational constraints shape this bias. In addition, specific scientific articles argue that the architecture of choice and presentation of information further exacerbates bias. As a result, the extant literature indicates that behavioral economics provides a robust empirical and theoretical framework for explaining the mechanisms underlying bias in human decision-making. No scientific articles were identified that challenged the existence or significance of cognitive bias in decision-making.

The results show that the integration of artificial intelligence into the behavioral economics literature focuses on the functions of detecting, predicting, and mitigating cognitive bias. Study (Ramon & Rita, 2025) Report on the use of AI to process complex data to identify patterns of bias in managerial and entrepreneurial contexts. Another article explains that AI is used as a decision-support system to mitigate human cognitive limitations through predictive analytics and risk assessment. In the context of digital marketing, (Vardikou et al., 2025) Document the application of automated systems to test the effectiveness of nudges based on the principles of behavioral economics. Empirical evidence suggests that artificial intelligence can improve decision-making efficiency by leveraging behavioral insights. Nonetheless, the scientific literature also observes that the efficacy of AI in bias mitigation depends on contextual and temporal factors. Specific research findings imply a fade-out effect associated with technology-mediated impulse-based interventions. In general, the results indicate that AI is widely regarded as a technical instrument for bias management rather than a normative agent. No scientific articles have been identified that explicitly integrate AI with a substantive value framework.

The results show that state-of-the-art research is at the stage of methodological and applicative integration, rather than normative. Recent articles combine behavioral insights with AI techniques, including topic modeling, systematic literature reviews, field experiments, and large-scale data analysis. The literature indicates a shift from conceptual studies to practical applications in management, marketing, and public policy. Nevertheless, the dominant scientific discourse positions behavioral economics as a contributing factor in algorithmic formulation, rather than as a fundamental criterion for ethical judgment. Empirical evidence suggests that the main emphasis of scientific inquiry is centered on efficacy, predictive precision, and operational performance. The nascent ethical framework tends to be procedural, encompassing principles such as transparency and accountability. There is a scarcity of evidence supporting the incorporation of cohesive normative value frameworks into artificial intelligence architectures. Thus, the state of the art identified is both technical and functional. These results are consistent across the articles reviewed.

The results indicate that the ethical AI literature, when integrated with behavioral economics, still has significant conceptual limitations. Articles that discuss AI ethics tend to limit their discussion to governance, statistical fairness, and explainability. No studies have been found that systematically associate cognitive bias with the principle of substantive justice. Some studies acknowledge that AI is not value-free but do not specify which values should serve as the normative basis. The literature also suggests that ethics is often positioned as an additional layer rather than as the foundation of design. In the context of nudging, ethics is discussed implicitly through concerns about manipulation, but without a clear moral evaluation framework. Article (Rubinson, 2010; Vardikou et al., 2025), suggesting that the effectiveness of an intervention is more often measured than its moral legitimacy. The literature does not show any normative consensus. Thus, conceptual limitations are systemic and consistent.

The literature suggests that cognitive bias has a greater impact on groups with limited resources and high situational stress. Study (Bertrand et al., 2006), documenting that low-income individuals face greater consequences of bias despite bias types similar to those experienced by other groups. The data show that default options, hassle factors, and framing significantly influence the decisions of vulnerable groups. Other articles suggest that digital nudging can magnify information asymmetry if not carefully designed. No articles were found that presented a specific ethical framework for protecting vulnerable groups in AI systems. The literature notes the potential for bias exploitation through digital technology. However, the solutions offered are generally policy or technical design. There are no findings that integrate substantive moral values as structural protection. Thus, the results indicate a normative protection gap.

The results of the synthesis show that none of the 17 articles explicitly use the principles of Amanah, 'Adl, and Ihsan as a conceptual framework. The values of trust, fairness, and social benefit appear, but only in secular and procedural terms. The principle of trust as a moral responsibility is not formulated in AI design. The 'Adl principle only appears in the form of statistical fairness or equality of outcomes. The Ihsan principle has not been identified as an explicit orientation in technology evaluation. The literature on innovation and creativity indicates that social benefits are often assumed rather than measured. No model demonstrates that AI confers a long-term moral advantage. Thus, the results indicate a clear normative vacuum regarding the three principles. This gap is consistent across the corpus of literature reviewed.

Overall, the results show that the behavioral economics and AI literature have advanced in bias mapping and the Development of technical tools for decision management. However, the evidence also suggests that the incorporation of normative values remains limited and irregular. Behavioral economics operates primarily as a descriptive paradigm, while artificial intelligence functions as a technical tool. Ethical considerations are included as an addition, not as a primary guiding factor. Systematic integration between biased understandings and substantive moral doctrines is not identified. The existing literature acknowledges the ethical dangers but fails to offer a coherent conceptual resolution. All of these insights were derived consistently from the 17 articles examined. The findings are presented as an empirical and conceptual framework without further explanation. These insights provide the basis for the subsequent discussion and refinement of the conceptual framework in the next section.

#### 4. Discussion

To answer RQ1 from the synthesis results, it is shown that the Development of state of the art research that integrates behavioral economics and artificial intelligence has reached a significant level of maturity in the descriptive and applicative dimensions, but not yet in the normative dimension. The behavioral economics literature has consistently provided a strong theoretical foundation for explaining various cognitive biases in decision-making, as demonstrated by (Amehmed & Etbiga, 2023; Hasan et al., 2025; Ho et al., 2006; Onoriode, 2025). The findings show that cognitive bias is systematic, predictable, and arises across social and economic contexts. Artificial intelligence is then integrated as a technical instrument to process large-scale behavioral data, detect bias patterns, and design more precise nudging-based interventions, as reported by (Ramon & Rita, 2025; Vardikou et al., 2025). Thus, the current state of the art is characterized by the strengthening of analytical and predictive capacity in understanding and managing decision-making bias. However, the literature also shows that AI is more often positioned as a decision-support system that improves efficiency, rather than as a system guided by a substantive ethical framework. This indicates that methodological progress has not been balanced with a deepening of moral reflection. Therefore, state-of-the-art developments can be considered technically strong, but not ethically comprehensive.

These findings are important because they indicate an imbalance between the technology's capabilities and the value framework that guides its use. Behavioral economics has succeeded in explaining the "how" and "why" of bias, while AI has expanded the operational application of that knowledge. However, as reflected in the literature analyzed, the questions of "for what purpose" and "on what value" the system have not received adequate attention. This is in line with the findings. (Rubinson, 2010; Vardikou et al., 2025), which suggests that the success of behavioral interventions is often measured by short-term effectiveness, rather than moral legitimacy or long-term social impact. Thus, the RQ1 discussion confirms that the current state-of-the-art integration of behavioral economics and AI is instrumental and utilitarian. These findings open up space for research that seeks to complement these technical advances with a more robust normative framework. In this context, this research contributes by shifting the focus from mere efficiency to substantive ethics.

To address RQ2, the results clearly reveal limitations and conceptual gaps in the literature on behavioral economics and ethical AI, particularly regarding the integration of normative value frameworks. Although the literature widely acknowledges that AI is not value-free, emerging ethical discussions tend to be procedural and minimalist. Principles such as fairness, transparency, and accountability are often mentioned but are rarely defined in substantial detail or linked to specific moral values. Study (Ramon & Rita, 2025; Vardikou et al., 2025), indicating that the primary focus of research remains on system performance and intervention effectiveness. Behavioral economics, by contrast, functions more as a diagnostic tool for identifying biases than as a source of ethical norms. This results in a gap between an empirical understanding of human behavior and a moral guide on how technology should mediate such behavior.

This gap becomes increasingly evident when the literature examines vulnerable groups and contexts characterized by high information asymmetry. Findings (Bertrand et al., 2006) suggest that cognitive bias has more severe consequences for poor people, even though the type of bias is similar to that of other groups. However, the literature that integrates these findings into ethical AI system design is still minimal. No normative framework was found that was explicitly designed to protect vulnerable groups from biased

exploitation through technology. The marketing and management literature also shows a similar trend, in which nudging and persuasion are judged by effectiveness rather than substantive fairness (Rubinson, 2010). As a result, conceptual constraints are not solely theoretical, but also have a real influence on the design and implementation of artificial intelligence systems. These findings are significant because they illustrate that, in the absence of a well-defined value framework, artificial intelligence can replicate prevalent differences.

In this discourse, scientific inquiry indicates that these conceptual differences are not merely methodological shortcomings but rather manifestations of the prevailing paradigm that distinguishes between facts and values. The fields of behavioral economics and artificial intelligence are advancing rapidly in both the empirical and technical domains, whereas ethical considerations are often treated as distinct. As a result, the integration between understanding bias and moral evaluation becomes fragmented. These findings underscore the need for alternative approaches that can bridge the gap. By systematically identifying these limitations, the study contributes to the literature by providing a rationale for developing a more holistic ethical AI. This expands the discourse from just "bias-aware AI" to "value-driven AI".

In RQ3, the position of the Principles of Amanah, 'Adl, and Ihsan as Alternative Frameworks shows that the principles of Amanah, 'Adl, and Ihsan can be positioned as alternative conceptual frameworks that strengthen the behavioral economics approach in the Development of ethical artificial intelligence. The synthesis findings suggest that the three principles are not explicitly found in the literature analyzed, although commensurate concepts, such as trust, fairness, and social benefit, are implicitly present. This indicates that a conceptual space remains unexplored in mainstream literature. The Trust Principle offers a dimension of moral responsibility that goes beyond technical transparency by emphasizing trust and accountability as ethical obligations, not just procedural compliance. In the context of behavioral economics, Amanah can serve as a basis for evaluating the use of behavioral insights, particularly when they are employed to influence individual decisions. As a result, Amanah expands the scope of behavioral economics from a purely descriptive framework to a prescriptive framework.

The 'Adl principle makes an important contribution in answering the limitations of statistical fairness that are dominant in the ethical AI literature. The findings suggest that fairness is often understood as output equality or algorithmic non-discrimination, without considering social context and distributional impacts. 'ADL allows for a more substantive evaluation of justice, taking into account the initial conditions, vulnerabilities, and long-term consequences of AI-based interventions. In the framework of behavioral economics, 'Adl can be used to assess whether choice architecture and nudging are really fair or reinforce inequality. Meanwhile, the principle of Ihsan introduces an orientation of social usefulness and moral superiority that has not been widely discussed in the literature. Ihsan demanded that AI systems not only avoid losses but also actively contribute to human well-being. Thus, the three principles form a complementary and relevant normative framework for ethical AI.

This discussion shows that the integration of Amanah, 'Adl, and Ihsan does not contradict behavioral economics, but rather strengthens it. Behavioral economics provides an empirical understanding of how decisions are made, while all three principles guide how decisions should be mediated by technology. By building a relationship between the two domains, the inquiry presents a more holistic framework for the Development of ethical artificial intelligence. This scientific contribution is significant because it extends the parameters of ethical AI beyond the simple aim of bias reduction, fostering a deeper moral ethos. Furthermore, this methodology facilitates a constructive dialogue between various value systems and modern scientific discourse. As a result, this research plays an important role in improving the theoretical and practical dimensions of ethical artificial intelligence.

## 5. Scientific Contributions

The primary significance of this study lies in its ability to identify and bridge the gap between technical advances and normative needs in the integration of behavioral economics and AI. By systematically mapping the state of the art, this study provides a comprehensive overview of the achievements and limitations of the existing literature. Furthermore, this research contributes by proposing an alternative conceptual framework that has not been explicitly explored in the previous literature. This contribution is



theoretical, as it enriches the ethical discourse of AI with substantive values, and methodological, as it demonstrates how conceptual literature review can be used for theory-building. In the scientific fields of behavioral economics and AI, this research extends the focus beyond efficiency and prediction to justice and social benefit. Therefore, this research is highly relevant to academics and practitioners.

## 6. Research Implications

The study has both theoretical and practical implications. Theoretically, this research encourages the development of ethical AI grounded in substantive values and integrated with an empirical understanding of human behavior. In practical terms, these findings can serve as a basis for AI system designers, policymakers, and practitioners to evaluate the ethical use of behavioral insights. The principles of Amanah, 'Adl, and Ihsan can be used as guidelines in algorithm design, data management, and evaluation of the social impact of technology. Thus, the implications of this research go beyond the academic realm and are relevant to professional practice.

## 7. Research Limitations

Despite its substantial theoretical contributions, this research has certain limitations. Primarily, this investigation is a review of the conceptual literature and does not include empirical validation. Second, the literature corpus is limited to 17 articles already available, so the findings depend on that coverage. Third, the Amanah, 'Adl, and Ihsan frameworks have not been tested in the context of the real implementation of AI systems. These limitations create opportunities for further research to conduct empirical validation and develop the operational model.

## 8. Conclusion

This study concludes that the integration of behavioral economics and artificial intelligence has advanced significantly in explaining, detecting, and managing cognitive biases in decision-making, yet remains dominated by technical and descriptive approaches. The findings show that behavioral economics consistently serves as a robust analytical framework for understanding patterns of cognitive bias. In contrast, AI serves as an instrument for improving decision-making efficiency and accuracy. Nonetheless, the study also confirms that the existing literature has not adequately integrated normative value frameworks into the design and implementation of AI-based decision-making systems. Ethics in AI is still understood in procedural and minimal terms, with a focus on statistical fairness and technical transparency, without an explicit substantive value foundation. This normative vacuum becomes increasingly relevant when AI is used to influence the decisions of individuals and vulnerable groups. Thus, this study confirms the existence of a conceptual gap between an empirical understanding of bias and a moral guide on how technology should be used.

The main contribution of this research lies in the submission of the principles of Amanah, 'Adl, and Ihsan as alternative conceptual frameworks to strengthen ethical artificial intelligence approaches based on behavioral economics. These three principles provide a normative dimension that complements the empirical approach by emphasizing moral responsibility, substantive justice, and the orientation of social utility. By positioning Amanah as the foundation of trust and accountability, 'Adl as a measure of contextual justice, and Ihsan as the orientation of moral excellence, this study expands the scope of ethical AI from simply mitigating bias to the formation of a moral decision-making system. This contribution is theoretical in nature, as it enriches the interdisciplinary discourse among behavioral economics, artificial intelligence, and ethics. In addition, this study also shows that a conceptual literature review can function as a valid method for theory-

building in a cross-disciplinary field. Thus, this research makes a relevant and meaningful contribution to the scientific development of ethical AI and behavioral economics.

Based on the explanation above, there are suggestions for future research. Further research can develop an operational model that translates the principles of Amanah, 'Adl, and Ihsan into algorithmic design indicators and AI system evaluation. In addition, empirical studies are needed to examine how the value framework affects decision-making outcomes in real-world contexts, such as management, public policy, or digital services. Future research may also expand the scope of the literature to include different cultural and institutional contexts to assess the relevance and adaptability of this normative framework. In addition, an experimental approach can be used to compare value-based AI systems with efficiency-focused systems. Thus, future research can validate the conceptual findings and assess their applicability. Overall, future research is expected to continue efforts to integrate understanding of human behavior and moral values into the Development of intelligent technologies that are fair, reliable, and beneficial to society.

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