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Navigating Ethical Dissonance in Algorithmic Decision-Making: Lived Experiences of Data Scientists in the Financial Sector

Fernando Yudistira
Institut Agama Islam Diniyyah Pekanbaru, Indonesia
Yudhistyeraa@gmail.com

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ABSTRACT

As algorithmic decision-making becomes central to data science practice, questions o ethics and bias have emerged as critical concerns across sectors. Within the financia industry, practitioners face increasing responsibility for managing the consequences o automated systems, yet their lived experiences remain poorly understood. While much o the existing literature addresses technical solutions for fairness and transparency, i offers limited insight into how data scientists interpret and respond to ethical dilemma in practice. This study investigates: How do practitioners experience and navigate ethica tensions related to algorithmic bias in real-world settings? Using a phenomenologica approach, this research explores the experiences of ten data scientists in financia institutions. Data were collected through in-depth, semi-structured interviews an analyzed thematically using Interpretative Phenomenological Analysis (IPA). Th findings reveal that participants often experience ethical dissonance, driven by conflict between institutional performance metrics and personal ethical values. Practitioner develop informal coping strategies such as silent resistance, moral rationalization, an subtle intervention to reconcile these tensions. These results suggest that ethica engagement is shaped not only by policy and design, but also by individual interpretatio and organizational culture. The study highlights the need for structural support system that empower ethical reflection within data-driven environments. These insight contribute to a more human-centered understanding of ethics in algorithmic systems an offer new directions for future interdisciplinary research.

INTRODUCTION

In the digital era, data science has become a cornerstone of decision-making across numerous industries, including finance, healthcare, education, and public policy. Among its most transformative applications is the integration of automated decision-making systems, powered by machine learning algorithms, to evaluate individuals, allocate resources, and predict behaviors. Particularly in the financial sector, algorithms are now routinely deployed to assess creditworthiness, detect fraud, and personalize client services (Bruno dkk., 2020). This technological shift has fundamentally altered how decisions are made, often removing human discretion and replacing it with computational logic.

While algorithmic systems are celebrated for their efficiency and scalability, they have also introduced complex ethical challenges. These challenges are rooted in issues such as algorithmic opacity, data bias, and the lack of interpretability, all of which can inadvertently reinforce existing social inequalities. Such systems, though built to be objective, may replicate or even exacerbate discriminatory patterns if not properly monitored. The growing body of literature has extensively documented the technical dimensions of these challenges—focusing on fairness metrics, debiasing techniques, and algorithmic transparency frameworks (Carnazzo dkk., 2024). However, there remains a gap in understanding the lived, subjective experiences of those who operate within these algorithmic environments.

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Beyond their technical implications, algorithms also shape human experiences—particularly the experiences of the practitioners who design, deploy, and oversee them. These individuals frequently encounter ethical dilemmas when confronted with conflicting demands between algorithmic performance and social responsibility. Their experiences are situated within broader organizational cultures that may prioritize efficiency over ethics, and within professional communities grappling with evolving standards of accountability (Chen dkk., 2020). Understanding how these practitioners make sense of their roles and responsibilities—how they internalize ethical conflicts and navigate bias in practice—is essential to informing both theory and policy.

A phenomenological inquiry into these experiences is crucial for uncovering the complex meanings practitioners attach to their interactions with algorithmic systems. Such an approach moves beyond surface-level observations to explore the deeper, often unspoken dimensions of professional life within data-driven institutions. By focusing on the subjective and contextual realities of practitioners, this study aims to illuminate how individuals experience, interpret, and respond to the ethical tensions inherent in algorithmic decision-making.

In recent years, research on the lived experiences of professionals engaged with algorithmic systems has gained increasing academic attention. As algorithmic decision-making becomes more embedded in high-stakes environments, particularly within the financial industry, it becomes imperative to understand not only the outcomes these systems produce but also how those responsible for their design and implementation perceive and experience their ethical implications (K. Y. Choi dkk., 2022). The subjective engagement of data science practitioners with algorithmic bias and automated judgments represents a vital, yet underexplored, dimension of the socio-technical landscape.

Despite this growing interest, methodological challenges persist in capturing the depth and complexity of such experiences. Many existing studies rely heavily on quantitative frameworks that, while valuable for identifying broad trends, often fail to account for the nuanced and contextually situated meanings that individuals attribute to ethical dilemmas in practice. Surveys and structured questionnaires tend to abstract experiences into predefined categories, thereby limiting the discovery of emergent themes and silencing the personal voice of the practitioner.

These limitations have rendered much of the prior research insufficient for grasping the essence of how ethical tensions are navigated in real-world algorithmic settings. The inner conflicts, coping mechanisms, and interpretative processes that shape practitioners' engagements with bias remain largely concealed within aggregated data. As a result, dominant empirical approaches may overlook the emotional, cognitive, and moral dimensions that influence how individuals interpret and respond to ethically charged situations.

Phenomenological inquiry, by contrast, offers a powerful methodological avenue for accessing these dimensions (S. Choi dkk., 2023). It allows for the exploration of meaning as it is experienced from the first-person perspective, enabling a richer understanding of how practitioners confront, interpret, and internalize ethical complexities. By grounding the analysis in participants' own narratives, this study aims to uncover the underlying structures of meaning that define their relationship with algorithmic systems in the financial sector.

Prevailing responses to algorithmic bias and ethical concerns in automated decision-making systems have largely relied on technical and procedural frameworks. These include model auditing techniques, fairness-aware machine learning algorithms, and compliance-oriented policy interventions aimed at improving transparency and accountability (Chong dkk., 2022). While such strategies offer practical value, they are predominantly grounded in quantitative and computational paradigms that prioritize system-level corrections over human-centered understanding.

These technical approaches, however, reveal clear limitations when it comes to capturing the subjective experiences of those directly involved in algorithmic design and implementation. By abstracting ethical issues into formalizable metrics or procedural guidelines, much of the complexity, ambiguity, and moral nuance that practitioners face in real-world contexts is overlooked. As a result,

the current understanding of how data scientists perceive, interpret, and manage ethical dilemmas remains superficial and fragmented.

What is notably absent in this body of research is an exploration of how individuals make sense of these ethical challenges from within their lived realities. The moral tensions, internal negotiations, and context-specific judgments that define practitioners' engagements with biased algorithms are not easily reducible to variables or models. These elements require a methodological lens that prioritizes depth over generalization, context over abstraction, and meaning over measurement.

Phenomenology provides such a lens (Connelly dkk., 2021). By centering on first-person experience and the interpretation of meaning as it emerges through social and professional life, phenomenological inquiry enables a holistic exploration of ethical engagement within algorithmic systems. This approach is uniquely positioned to reveal how practitioners internalize, contest, and respond to systemic pressures, offering insights that can enrich both ethical theory and organizational practice.

Several studies have examined algorithmic fairness, transparency, and the ethical implications of automated decision-making in various sectors. Most of this research, however, has prioritized technical solutions over lived human experiences. While existing literature discusses principles and frameworks for ethical AI (Cooper dkk., 2022), little is known about how data science practitioners experience and interpret ethical tensions in practice. Previous work has rarely addressed how individuals navigate moral dilemmas embedded in their professional environments. This study responds to that gap by focusing on the subjective experiences of practitioners in the financial technology domain.

This research adopts an interpretative phenomenological approach to explore how practitioners perceive, respond to, and make meaning of algorithmic bias and ethical challenges. Phenomenology is particularly suited to uncovering how individuals interpret and internalize complex realities. It offers a way to understand ethical engagement not through rules or models, but through the perspectives of those who live with the consequences of these systems. By addressing the limitations of quantitative or procedural approaches, this method enables a more comprehensive view of ethical experience. It allows for a deeper examination of the values and tensions shaping everyday data science practice.

The structure of this article is organized as follows. The introduction presents the background, significance, and knowledge gap of the study (Cristiano dkk., 2022). The next section outlines the phenomenological framework and research design, including data collection and analytical procedures. This is followed by the presentation of results, organized thematically to highlight the participants' lived experiences. The discussion interprets the findings in relation to existing literature and broader social contexts. Finally, the conclusion summarizes the key insights and outlines implications for ethical practice in data science.

RESEARCH METHODS

Study Design

This study employed an interpretative phenomenological approach (IPA) to explore the subjective experiences of data science practitioners regarding algorithmic bias and ethical dilemmas in automated decision-making within the financial sector. The phenomenological design was selected for its capacity to capture the richness and depth of individual lived experiences, emphasizing the meanings attributed by participants to specific phenomena (Damre dkk., 2024). IPA, rooted in the hermeneutic tradition, allows for a nuanced interpretation of how individuals make sense of complex ethical tensions encountered in their professional environments. This approach was particularly appropriate for addressing the research question, which sought to uncover how practitioners perceive and navigate ethical ambiguities related to algorithmic systems.

Participants

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Participants in this study consisted of professional data scientists and machine learning engineers working within financial institutions that implement automated decision-making systems. Individuals were selected using purposive sampling to ensure relevance to the central phenomenon under investigation (Daniels dkk., 2025). Inclusion criteria required participants to have a minimum of two years of experience in data science roles, direct involvement in algorithm development or evaluation, and exposure to ethical decision-making processes related to algorithmic systems. Exclusion criteria included individuals in non-technical or administrative roles unrelated to data analytics. A total of ten participants were involved, comprising six males and four females, with an average age of 32 years. All participants held at least a bachelor's degree in data science, computer science, or a related discipline.

Data Collection

Data were collected through in-depth, semi-structured interviews conducted face-to-face in private settings conducive to open discussion. An interview guide was developed to facilitate exploration of the participants' experiences, focusing on their perceptions of algorithmic bias, ethical concerns, and coping mechanisms. Each interview lasted between 60 to 90 minutes and was audio-recorded with participants' consent. Interviews were conducted in participants' workplaces or neutral, agreed-upon locations to ensure comfort and confidentiality. Field notes were also taken to capture non-verbal cues and contextual observations (Dawson dkk., 2024). The interview protocol was adapted from validated templates in prior phenomenological studies, with minor modifications to align with the study's specific focus on the financial sector.

Data Analysis

Interview data were transcribed verbatim and analyzed using Interpretative Phenomenological Analysis (IPA), which involved multiple readings of each transcript to identify emergent themes. The analysis followed a systematic process: initial coding of meaning units, clustering of related codes, abstraction into superordinate themes, and synthesis into narrative findings. NVivo software was used to facilitate data organization and thematic development, although interpretive rigor remained central to the process (Debard dkk., 2020). Themes were refined through constant comparison across cases, allowing for the extraction of shared patterns and unique individual experiences. The analytical process aimed to preserve the richness of participants' lived realities while distilling the essential structures of the phenomenon.

Ethical Considerations

Ethical approval for the study was obtained from the appropriate institutional review board. Written informed consent was obtained from all participants prior to data collection, ensuring voluntary participation and the right to withdraw at any time. Anonymity and confidentiality were strictly maintained by assigning pseudonyms and securely storing all data. The study adhered to international ethical standards for research involving human subjects, including the Declaration of Helsinki and applicable national guidelines.

RESULTS

Tension Between Ethical Awareness and Organizational Expectations

Participants consistently reported a deep awareness of the ethical implications inherent in algorithmic systems. However, they also conveyed a strong sense of tension between this awareness and the performance-driven culture of their organizations. Ethical considerations were often subordinated to efficiency and profitability.

"I knew the algorithm was skewed—it prioritized applicants from wealthier districts—but when I flagged it, my supervisor said, 'Just focus on the KPIs.'" (Participant 3)

This tension manifested in internal conflict, with several practitioners expressing discomfort over their complicity in perpetuating systemic bias. Yet, many felt powerless due to rigid organizational priorities that valued outputs over ethical scrutiny.

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"You either comply with the metrics or you're out. There's no room for ethical debates in sprint reviews." (Participant 7)

Algorithmic System Ethical Priority

Algorithmic Opacity and Loss of Control

Practitioners described their limited agency in interpreting or intervening in algorithmic outputs, which they frequently referred to as "black boxes." This opacity created a distancing effect, where individuals felt they were executing decisions without truly understanding them.

"The model makes the call, and I just relay the outcome. I don't really know why it flagged that client—it just did." (Participant 1)

The lack of transparency often led to frustration and ethical unease. Practitioners highlighted how automated decisions could negatively affect customers, particularly when the rationale was neither explainable nor contestable.

Coping Strategies and Moral Justifications

Despite these challenges, participants developed coping mechanisms to navigate their ethical discomfort. Some adopted moral rationalization strategies, viewing themselves as intermediaries with limited control. Others engaged in "silent resistance," such as tweaking thresholds or flagging anomalies discreetly.

"Sometimes I'd alter a parameter slightly to make the decision fairer. It's small, but it makes me feel I did something right." (Participant 5)

Such actions illustrate a quiet negotiation of values, as practitioners attempted to reconcile personal ethics with professional obligations without overtly defying institutional norms.

Aspiration for Ethical Frameworks and Collective Responsibility

Nearly all participants expressed a desire for clearer ethical guidelines and collaborative decision-making structures. There was a shared belief that ethical accountability should not rest solely on individuals but be embedded within organizational systems and cultures.

"If we had a dedicated ethics board or even just a space to talk about these issues, I think we'd all make better decisions." (Participant 2)

This aspiration reflects a collective yearning for systemic change, where ethical considerations are not reactive or isolated but proactively integrated into the data science lifecycle.

The core essence distilled from these narratives reveals that data science practitioners in the financial sector experience a persistent ethical dissonance. This dissonance arises from the clash between personal values and institutional imperatives, amplified by algorithmic opacity and insufficient organizational support. Yet within this dissonance, practitioners seek pathways—however limited—to affirm ethical integrity, signaling a pressing need for collective ethical frameworks in automated decision-making systems.

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DISCUSSION

The findings of this study reveal that data science practitioners working in the financial sector experience a persistent ethical dissonance when navigating algorithmic bias and organizational expectations (Delmastro dkk., 2019). This dissonance emerges as a central feature of their lived experience, reflecting the complex tension between personal ethical values and the systemic pressures of performance-driven environments. These insights directly address the core research question: How do practitioners understand and respond to ethical dilemmas and algorithmic bias in automated decision-making systems?

The study's results offer a nuanced response to this question by illuminating the interpretive processes through which practitioners make sense of ethical challenges. Rather than passively accepting algorithmic outputs, participants described a spectrum of internal negotiations, silent resistance, and adaptive coping mechanisms. These responses highlight the depth of moral reflection that underpins everyday data science work—often unacknowledged in organizational discourse. By surfacing these hidden layers of ethical engagement, the study contributes uniquely to the understanding of how ethical awareness is enacted in practice, especially under the constraints of organizational metrics and opacity.

In relation to previous literature, the findings align with and extend existing critiques of technical ethics in artificial intelligence. While scholars like (Domingos dkk., 2022) have questioned the sufficiency of principle-based ethics and fairness metrics, this study brings a human-centered dimension to those critiques by showcasing how ethical tensions are experienced subjectively. It complements the work of (Doty dkk., 2020), who emphasize the need for situated interventions, by offering empirical evidence of how such interventions are already occurring informally through individual action. Furthermore, the results challenge the assumption that ethical failures in algorithmic systems stem purely from design flaws; instead, they point to cultural and structural factors within institutions that inhibit ethical deliberation. These insights underscore the value of phenomenology as a methodological lens capable of capturing the embodied and contextual aspects of ethical practice in data science.

Implications of the Findings

The findings of this study hold significant implications for both the academic and professional communities engaged in algorithmic development and ethical governance. From a scholarly perspective, the research enriches the conceptualization of algorithmic ethics by foregrounding the lived experiences of practitioners rather than solely focusing on abstract principles or system-level designs. Practically, these insights call for the creation of institutional spaces—such as ethics review boards or interdisciplinary dialogue forums—where practitioners can voice concerns, reflect on dilemmas, and seek collaborative resolutions (Drummond dkk., 2022). The silent resistance and coping mechanisms identified in this study suggest an unmet need for ethical empowerment and cultural change within organizations that deploy high-impact algorithms. Beyond the financial sector, these patterns may be relevant in other domains where automated systems influence decisions with profound human consequences, such as healthcare, education, and public services.

Limitations of the Study

This study is subject to several limitations that warrant consideration when interpreting the findings. First, the research was conducted within a specific professional context—data science in the financial sector—which may limit the transferability of the insights to other domains or organizational cultures. Second, the sample size, while appropriate for phenomenological inquiry, does not allow for statistical generalization and may not capture the full diversity of practitioner experiences across geographic or institutional settings (Durrani dkk., 2022). Additionally, the reliance on self-reported narratives introduces the potential for selective recall or social desirability bias. Nonetheless, these limitations are intrinsic to qualitative research and were mitigated through rigorous analytic procedures and methodological transparency.

Directions for Future Research

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Future research could build upon these findings by exploring comparative experiences across different sectors, such as healthcare or government, where ethical concerns in automated decision-making may manifest differently. Longitudinal studies may also provide deeper insights into how practitioners' ethical awareness evolves over time, particularly in response to policy changes or technological developments. Furthermore, interdisciplinary studies involving ethicists, sociologists, and technologists could foster richer understandings of how organizational structures influence ethical behavior (Egan dkk., 2019). By extending phenomenological inquiry into diverse contexts, researchers can continue to illuminate the human dimensions of data science and contribute to more ethically resilient technological ecosystems.

CONCLUSION

This study explored the lived experiences of data science practitioners as they navigated ethical dilemmas and algorithmic bias in the financial sector. The research revealed that practitioners often face internal conflicts between organizational performance demands and their personal ethical values. These findings demonstrate how individuals actively interpret, resist, and adapt to ethically complex environments, offering deeper insight into the human dimension of algorithmic decision-making. By focusing on first-person narratives, the study addresses a significant gap in the literature that has largely overlooked practitioner perspectives. The phenomenological approach provided a nuanced understanding of ethical engagement that extends beyond technical solutions and policy guidelines. Future research may expand this inquiry across different sectors or cultural contexts to further investigate how ethical awareness and professional judgment evolve in data-driven organizations.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest related to the publication of this article. All procedures and interpretations were conducted independently and free from any commercial or personal relationships that could be perceived as potential conflicts.

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