

Exploring the Role of Digital Tools in Ethical Managerial Decision-Making

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Abstract

The rapid integration of digital technologies into managerial work has reorganized ethical decision-making in organizations. Technology holds the promise of efficiency and transparency but leaves the impact of technology on moral thought and managerial accountability unclear. This study uniquely combines Ethical Decision-Making Theory and Socio-Technical Systems Theory to investigate how digital tools influence ethical judgment and behavior in managerial contexts. Utilizing a qualitative exploratory methodology, the research integrates insights from an in-depth literature review and semi-structured interviews. Thematic analysis indicates that online resources can enhance ethical consistency and moral awareness if applied reflectively, but may reduce moral sensitivity when managers rely excessively on algorithmic guidance. Findings highlight a reciprocal relationship between human judgment and technological mediation, offering practical recommendations for managers to foster responsible and ethically informed decision-making in digital environments. A conceptual model is proposed to guide organizations in aligning digital intelligence with moral cognition, bridging theoretical understanding and actionable practice. Ethical decision-making in the digital era, this study concludes, is less about algorithmic transparency and more about cultivating responsible human judgment within technologically mediated contexts.

Keywords: Ethical Decision-Making, Digital Ethics, Managerial Ethics, Artificial Intelligence in Management, Socio-Technical Perspective.

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I. INTRODUCTION

Digitalisation has completely revolutionised managerial practice over the past decade, forcing organisations to rethink decision-making in a rapidly data-driven world. The heavy reliance on computer programs such as decision support systems, predictive models, and AI assistants not only streamlined processes but also shifted complex ethical issues into the realm of managers (Alshadoodee et al., 2022; Marion & Fixson, 2021). Current research reveals that over 70% of world business leaders are becoming more and more confident about algorithmic intelligence in strategic decision-making, yet they are unsure whether it is right to outsource moral reasoning to machines (Farayola & Amoo, 2024). This tension between computational thinking and moral responsibility marks the start of an era of managerial ethics in which human values and computational logic must increasingly converge.

Researchers have examined the technical and strategic advantages of digital technology for decision-making, e.g., in medicine (Braun et al., 2021; Vasey et al., 2022), supply chain management (Alavi et al., 2021), and finance (Lehner et al., 2022). But they are collectively

concerned with functionality and effectiveness rather than with the ethical concerns that arise when technology supports managerial choices. Ethical leadership (Arar & Saiti, 2022; Koay & Lim, 2022) and moral reasoning (Belgasem-Hussain & Hussaien, 2023) have been researched in business ethics, but few have investigated the crossroads of human-focused constructs and virtual spaces for choice. A socio-technical view offers a strong foundation for this, as it recognises that technological systems are value-laden and embedded in organisational values, responsibility systems, and moral environments (Adriaensen et al., 2022; Gherardi & Laasch, 2022).

Although awareness of digital ethics is increasing, the literature still treats technical systems and ethical judgment largely as separate domains. It is widespread in the literature to consider technology as being more or less a neutral enabler of efficiency or a potential source of ethical risk without taking into account the manner in which assistive computational systems can interact directly with managers' moral sensitivity, judgment, and intent (Rachmad, 2022; Stenmark & Redfearn, 2022). There remains limited theoretical integration between AI-based decision support systems and the core stages of ethical decision-making processes. This gap opens space for understanding digital technology not merely as a tool, but as a socio-technical actor that can actively shape, enable, and constrain ethical reasoning within organisational settings (Dong et al., 2023; Kirkegaard et al., 2023).

Accordingly, this study investigates how digital tools both facilitate and complicate ethical managerial decision-making by examining the interaction between technological affordances and human moral cognition. In other words, it explores how managers interpret and apply digital technologies within ethically complex situations, and how these tools reshape the balance between rational efficiency and moral responsibility. Based on Socio-Technical Systems Theory and Ethical Decision-Making Theory, the research highlights the paradoxical role of technology as both a facilitator and an inhibitor of ethical reflection in organisations (Cabana & Kaptein, 2021; Perozzo et al., 2022). The main objective of this study is to explain how digital technologies influence moral awareness, ethical judgment, and accountability in managerial decision-making. This study addresses the following research question: How do digital technologies facilitate, frame, and potentially obscure the ethical dimensions of managerial decision-making?

This study offers a novel contribution by explicitly integrating Ethical Decision-Making Theory with Socio-Technical Systems Theory within a unified conceptual framework, an approach that remains underdeveloped in existing digital ethics literature. Theoretically, the paper contributes to the growing field of responsible management and digital ethics by bridging human-centered moral reasoning with technology-centered system design (Gherardi & Laasch, 2022; Mökander et al., 2021). In practice, the article offers organisational managers guidance on using decision

support technologies to strengthen transparency, accountability, and moral integrity (Handoko et al., 2025; Tiron-Tudor et al., 2025). As digitisation accelerates, such knowledge becomes essential to prevent technology-driven decisions from eroding the very moral values organisations seek to uphold. Research organisation is as follows. Section 2 presents the theoretical framework and literature concerning ethical decision-making and socio-technical systems in the management field. Section 3 presents the qualitative exploratory approach used in this research. Section 4 discusses the findings, focusing on the connection between digital tools and ethical thinking. Finally, Section 5 concludes with theoretical and managerial implications and future research directions.

II. LITERATURE REVIEW

The emergence of digital technology has profoundly restructured managerial decision-making in modern organizations. As digitalization has gained momentum, managers are increasingly using data-centric technology such as decision support systems (DSS), artificial intelligence (AI), and analytics dashboards for strategic and operational decisions (Brendel et al., 2021; Lehner et al., 2022). As these technologies increase efficiency and accuracy, new ethical concerns arise regarding accountability, transparency, and respect. Digital ethics in this context emerges as a critical paradigm to differentiate the extent to which technology affects the morality of managerial choices (Gherardi & Laasch, 2022). Rather than treating digital tools merely as technical enablers, recent scholarship increasingly conceptualizes them as ethical mediators that actively shape managerial cognition and responsibility. Theoretical bases and empirical studies of digital technologies and moral decision-making are established in this chapter with particular focus on the interconnection between the two concepts within socio-technical systems. This combines existing studies, establishes critical gaps, and outlines the conceptual basis for this research.

A. Ethical Cognition and Digital Mediation

The Ethical Decision-Making Theory illustrates moral behavior as a four-step process consisting of moral awareness, moral judgment, moral intent, and moral behavior. When applied in management practice, the steps explain how managers recognize ethical dilemmas, weigh moral outcomes, decide to remain aligned with ethical choices, and act accordingly (Stenmark & Redfearn, 2022). In digitally mediated environments, these stages are no longer purely internal cognitive processes but are increasingly shaped by algorithmic input and data-driven recommendations. Algorithmic systems thus readily render moral trade-offs commonplace with the risk of dulling managers' responsibility or sensitivity (Braun et al., 2021). But with openness, the same machines can enable moral sensitivity and fairness by putting the ethical dimensions of decisions in the spotlight (Antoniadi et al., 2021; Frisinger & Papachristou, 2023). Therefore,

digital technology can be empowering or dis-empowering of good practice in ethical decision-making depending on how intimately it is embedded into organisational practice (Arar & Saiti, 2022; Farayola & Amoo, 2024). This indicates that digital tools operate not only as informational aids but also as cognitive frames that can amplify or suppress moral awareness.

B. Socio-Technical Integration

The Socio-Technical Systems (STS) Theory offers a key understanding of the interaction between human values and digital technology within organizations. From the Tavistock Institute, the theory assumes that there exists high performance whenever social and technical subsystems are well-balanced (Adriaensen et al., 2022). Within managerial settings, the balance assures that technological innovation such as digital decision aids pursues not only operational efficiency but ethical purpose as well (Kirkegaard et al., 2023). There is evidence that organisations which achieve socio-technical balance generate ethical cultures in which accountability, trust, and transparency are paramount regardless of technological sophistication (Dong et al., 2023; Farrow, 2023). However, when people are marginalized, technology can provide opportunities for moral disengagement or "ethical outsourcing" to AI systems (Mor, 2025; Perozzo et al., 2022). It is therefore essential to incorporate ethical principles into socio-technical design so that technology enhances rather than undermines moral agency in managerial practice. From this perspective, technology is not ethically neutral but is structurally embedded with moral assumptions through its design, implementation, and use contexts.

C. Managerial Moral Agency in Digital Decision-Making

From data analysis programs in computers to artificial intelligence-based decision engines, digital solutions now take center stage in operational and strategic management. They increase precision, speed, and predictive ability but also change the site of moral responsibility (Lehner et al., 2022). According to (Tiron-Tudor et al., 2025) Digitalization introduces "ethical duality": technology that brings more responsibility can simultaneously conceal it when decision-making logic is opaque. Decision Support Systems (DSS) and AI-based analytics facilitate quicker experimentation with scenarios of high-order consequences and decision-making within environments of uncertainty (Alshadoodee et al., 2022; Vasey et al., 2022). Where these systems are too complex to be explained, however, human beings will willingly submit to algorithmic suggestion, a condition known as moral deskilling (Brendel et al., 2021). Thus, managerial moral agency in digital contexts is negotiated between human judgment and algorithmic authority rather than being fully autonomous. The ethical issue is thus less technical and more conceptual in nature: assuring digital assistance improves human moral deliberation (Gherardi & Laasch, 2022).

D. Empirical Findings on Digital Ethics and Decision-Making

Empirical studies have examined the use of digital technology in ethical decision-making and organisational behaviour. For instance, (Ford et al., 2021) concluded that ethical trust mediates between users' conformity and digital system use, while (Brendel et al., 2021) noted that algorithmic bias could undermine ethical accountability if it is not addressed. In education and health, studies by (Dancsa et al., 2023; Langegård et al., 2021) show that cooperation and moral sensitivity are fostered by well-designed digital tools underpinned by ethical reasoning. In managerial contexts, (Cabana & Kaptein, 2021; Martínez et al., 2021) asserted that organizational moral culture is the most important determinant in using technology ethically. Whereas (Handoko et al., 2025; Putri & Ainindhira, 2025) described how transparency-enabled information systems facilitate managerial integrity and traceability of decision-making. However, there is no integrating framework that bridges the gap involving ethical decision theory and socio-technical considerations in managerial digital environments. Collectively, these studies indicate that ethical outcomes of digitalization are contingent on both system design and organisational moral infrastructure.

E. Research Gap

While the literature contains much information, it also contains significant gaps. The majority of research focuses either on technological capability or ethical theory without integratively examining their interaction (Farayola & Amoo, 2024; Lehner et al., 2022). Furthermore, most empirical research relies on healthcare or education sectors with limited translation into managerial decision-making contexts (Frisinger & Papachristou, 2023). More critically, there is still no comprehensive model that explicitly integrates Ethical Decision-Making Theory with Socio-Technical Systems Theory to explain how digital tools shape moral awareness, judgment, and accountability in managerial practice. This study addresses that gap by theorizing digital tools as ethical mediators that affect managerial moral sensitivity, duty, and decision quality in digital environments (Adriaensen et al., 2022; Tiron-Tudor et al., 2025).

F. Previous Studies and Analytical Synthesis

To solidify the striking findings of previous studies, Table 1 presents paradigmatic studies on managerial decision-making, research approaches, results, and constraints regarding digital ethics. This synthesis serves as the foundation for developing the conceptual framework of this research.

Table 1. Summary of Previous Studies Regarding Digital Ethics and Managerial Decision-Making

Author(s) & Year	Method	Main Findings	Limitations
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(Brendel et al., 2021)	Conceptual / Review	Digital tools can cause moral deskilling without ethical oversight.	Lacks managerial-level validation.
(Lehner et al., 2022)	Qualitative	Ethical culture supports transparency in digital decision-making.	Sector-specific; small sample.
(Braun et al., 2021)	Experimental	Algorithmic logic alters perception of moral responsibility.	Artificial environment.
(Antoniadi et al., 2021)	Systematic Review	Explainable AI (XAI) improves ethical awareness.	Focused on healthcare sector.
(Gherardi & Laasch, 2022)	Theoretical	Ethics in digital management is socio-relational.	No empirical testing.
(Adriaensen et al., 2022)	Comparative	Socio-technical balance enhances ethical outcomes.	Does not assess behavioral impacts.
(Farayola & Amoo, 2024)	Survey	Analytics tools enhance decision accuracy but may reduce moral engagement.	Limited ethical constructs measured.
(Tiron-Tudor et al., 2025)	Mixed Methods	Ethical use of digital tools increases managerial accountability.	Cross-sectional; causality not tested.
(Martínez et al., 2021)	Survey	Ethical culture mediates responsible use of information systems.	Indicators for ethics unclear.
(Handoko et al., 2025)	Case Study	MIS improves transparency and traceability.	Single case; limited generalizability.

Based on Table 1, prior studies consistently demonstrate that digital tools enhance efficiency and transparency, yet several studies simultaneously report risks of moral deskilling, reduced ethical engagement, and ethical opacity. While some studies emphasize the enabling role of transparency and explainability (Antoniadi et al., 2021; Handoko et al., 2025), others highlight the dangers of algorithmic dominance and accountability diffusion (Braun et al., 2021; Brendel et al., 2021). Importantly, very few studies explicitly integrate ethical cognition with socio-technical system design, thereby reinforcing the originality of the present research.

G. Conceptual Framework

Based on the integration of Table 1, a conceptual model is constructed to depict the interactions among digital tools, ethical decision-making processes, and managerial accountability, within a socio-technical context. The model integrates theoretical and empirical literature from prior research. Figure 1 illustrates this conceptual framework, outlining the interactions among the study's core components.

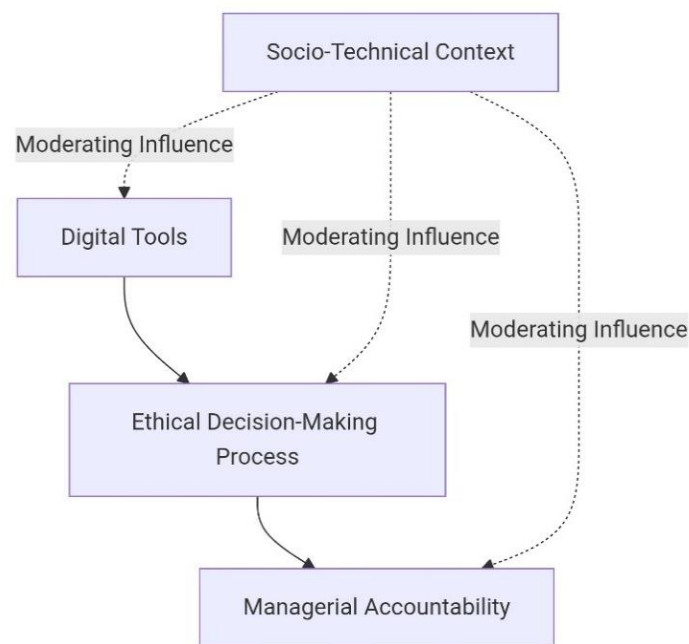


Figure 1. Conceptual Framework of the Study

The framework proposes a causal sequence in which digital tools influence ethical awareness and ethical judgment, and, subsequently, managerial accountability. It is expected that technology has a direct influence on how managers engage in ethical decision-making through its impact on moral awareness, judgment, and intent. Ethical decision-making also affects the extent of managerial responsibility reflected in ethical and transparent outcomes (Tiron-Tudor et al., 2025). They are mediated by the socio-technical context, aligning technology with organizational norms, values, and human agency (Adriaensen et al., 2022; Gherardi & Laasch, 2022). Operationally, this means that digital tools first shape how ethical issues are perceived (ethical awareness), then influence how options are evaluated (ethical judgment), and finally affect the degree to which managers assume responsibility for their decisions (ethical accountability). Thus, managerial decision-making in the digital age is not a purely technological process nor solely a human moral act, but the outcome of a dynamic interaction between computational systems and ethical reasoning. This framework positions technology as both a cognitive amplifier and a moral risk factor, depending on the socio-technical conditions under which it is deployed.

III. RESEARCH METHOD

A. Research Design

Research employs a qualitative exploratory design to examine how digital technologies affect managers' ethical judgments in contemporary organizations. Qualitative research offers in-depth

description of managers' moral reasoning and socio-technical environments that affect their decisions (Arar & Saiti, 2022; Gherardi & Laasch, 2022). With a focus on mature managerial tendencies, the current research seeks to uncover the interconnections among technologies such as decision support systems (Alshadoodee et al., 2022), AI analytics (Tiron-Tudor et al., 2025), and data platforms (Putri & Ainindhira, 2025) and human ethical sensitivity and accountability. This is consistent with Ethical Decision-Making Theory and Socio-Technical Systems Theory and provides an adaptive framework to accept moral, cognitive, and technological interdependencies. The research's exploratory design follows the dearth of empirical literature regarding digital ethics in managerial situations (Brendel et al., 2021; Farayola & Amoo, 2024) and thus enables the development of grounded findings rather than hypothesis testing. The use of qualitative inquiry also preserves the richness of context, which is required in accounts of organizational settings in which digital tools facilitate or replace ethical decision-making (Lehner et al., 2022; Marion & Fixson, 2021).

B. Population, Sample, and Sampling Method

Populations of interest are mid- to senior managers in technology-based organizations making decisions via digital tools. Purposive sampling was used in an effort to engage participants with first-hand experience of digital decision aids (Ford et al., 2021; Frisinger & Papachristou, 2023). This study selected 12–15 managers from finance, manufacturing, and education organizations that have formally implemented AI-driven analytics or DSS as part of their decision-making infrastructure. The inclusion criteria were: (1) occupying a managerial or executive position, (2) active involvement in strategic or ethically sensitive decision-making, and (3) working in organizations with moderate to high levels of digital maturity, indicated by routine use of AI dashboards, predictive analytics, or automated reporting systems. We sampled the respondents based on intensive use of technology support and direct engagement in ethically consequential decisions. This was based on the premise that information-rich cases (Alavi et al., 2021) would provide deeper insight into how ethics operates in technologically mediated managerial environments.

C. Data Sources and Data Collection Techniques

Primary and secondary information were collected. Primary information were collected through semi-structured interviews to enable participants to express ethical concerns, thought, and the role of technology in decision-making scenarios (Chae et al., 2021; Neill & Bowen, 2021). Face-to-face and online interviews were conducted via encrypted video to keep them confidential and to make them easy to conduct. Secondary data were collected through published journals, business ethics codes, and organizational policy documents on digital governance. Triangulation offers

interpretive quality based on expectations of qualitative rigor (Cabana & Kaptein, 2021). Interviews lasted approximately 45–60 minutes and were consent-based, audio-recorded, transcribed verbatim, and coded in NVivo for systematic thematic analysis.

D. Research Variables and Operational Definitions

Although the research is qualitative, the theoretical framework's conceptual dimensions are used to develop the inquiry. Variables are used in developing the interview guide and thematic coding. Variable specificity, its source theory, operational definition, and examples are in Table 2.

Table 2. Research Variables and Operational Definitions

Concept	Theoretical Source	Operational Definition	Example Indicator
Digital Tool Utilization	(Alavi et al., 2021; Marion & Fixson, 2021)	The extent to which managers use digital decision support or analytics tools in ethical decision contexts.	Integration of DSS, AI, analytics platforms.
Ethical Awareness	(Brendel et al., 2021)	The degree to which managers recognize moral issues within digital decision processes.	Identifying ethical risks in algorithmic recommendations.
Decision Accountability	(Carroll, 2021; Gherardi & Laasch, 2022)	Managers' sense of moral and professional responsibility for technology-assisted decisions.	Justification and transparency of decision outcomes.

Table 2 operationalizes the core constructs of the conceptual framework by translating abstract ethical and socio-technical dimensions into observable indicators used in interviews and coding. These variables directly reflect the causal structure proposed in the conceptual framework, linking digital tool utilization to ethical awareness and managerial accountability.

E. Research Instrument and Validity Assurance

The main research instrument employed was a semi-structured interview guide based on the four stages of Ethical Decision-Making Theory: moral awareness, judgment, intent, and behavior. Pilot testing of the interview questions was conducted with two scholars in digital management and organizational ethics to create content validity (Roszkowska & Melé, 2021). The pilot interviews were conducted with two managers to maximize clarity of questions and thematic value. Qualitative data credibility was achieved through triangulation (source of data and theory), peer debriefing, and member checking. The perception of the participants and meaning were captured on transcripts to help in ensuring accuracy and interpretive fairness (Hassan et al., 2022).

F. Research Procedure

The study adopted a systematic process outlined in Figure 2, showing the overall sequence of the research. The steps started with literature synthesis, conceptual model development (see Figure 1: Conceptual Framework), interview tool design, data collection, coding, and thematic analysis.

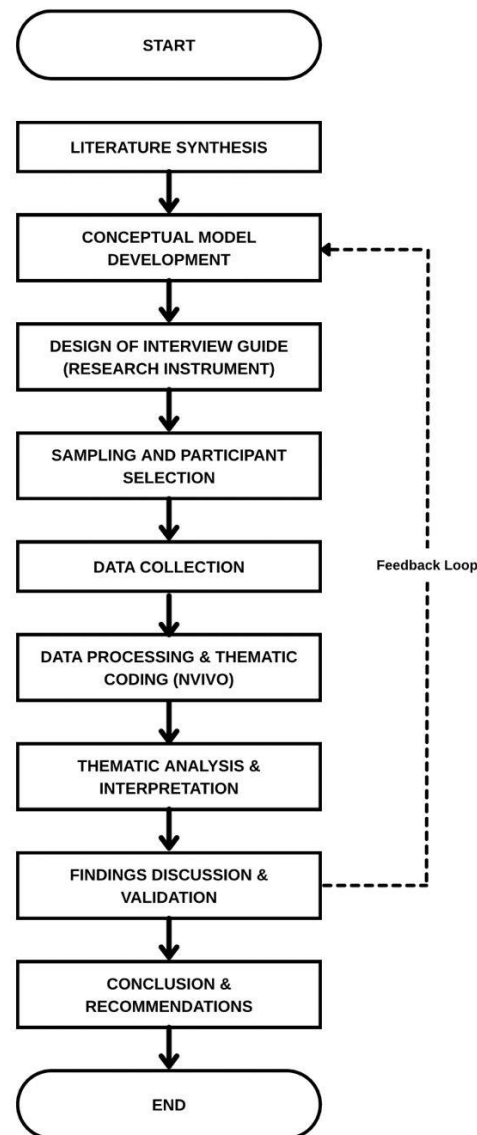


Figure 2. Research Flow of the Study

This design of the process guarantees theoretical contexts' alignment with empirical information, theory-practice conversation in an iterative frame at the core of exploratory management studies (Adriaensen et al., 2022; Mor, 2025).

G. Data Analysis Technique

Data were analyzed using the six-phase Thematic Analysis procedure proposed by (Braun & Clarke model) consisting of (1) data familiarization, (2) initial code generation, (3) theme searching, (4) theme reviewing, (5) theme defining and naming, and (6) report production. This process was aligned with the socio-technical and ethical constructs embedded in the conceptual framework. Coding followed open, axial, and selective phases guided by ethical and socio-technical orientations. Emerging themes were consolidated into three thematic clusters: (1)

Digital Mediation of Moral Awareness, (2) Data-Based Ethical Reasoning, and (3) Managerial Accountability in AI-Assisted Environments. Data saturation was achieved when no new conceptual insights emerged from additional interviews (Farrow, 2023; Lehner et al., 2022).

H. Ethical Considerations

Given the sensitivity of ethical issues in managerial environments, ethical clearance was obtained from the institutional review board prior to data collection. All participants were guaranteed voluntariness, confidentiality, and the right to withdraw at any time upon giving informed consent. Personal identifiers were anonymized and securely stored on encrypted digital storage accessible only to the research team (Belgasem-Hussain & Hussaien, 2023). The research also follows (Rachmad, 2022) standards of ethical research that support the alignment of human moral values with technological innovation. By maintaining respect, transparency, and data anonymity, the research preserves respondents' dignity while strengthening scholarly integrity in digital ethics research. This methodological approach enables systematic examination of how digital technologies enable, constrain, and reshape managerial moral agency within socio-technical organizational environments.

IV. FINDINGS

A. Overview of Participant Profile and Data

Fourteen participants were interviewed, starting with top- and middle-level managers in the finance, manufacturing, and education sectors of technology-intensive firms. Elaborated that participants were chosen through purposive sampling as they had first-hand exposure to digital decision-support tools such as DSS, AI dashboards, and analytics platforms. The participants' managerial experience ranged from 8 to 15 years, and they all indicated direct responsibility for ethics or strategic decision-making facilitated by digital technology. The diversity among participants enabled the study to examine how ethical responsibility and sensitivity vary across organizational and technological settings. Using the Thematic Analysis process described, the following three salient themes were identified: Digital Mediation of Moral Awareness, Ethical Decision-Making Based on Evidence, and Managerial Responsibility in AI-Supported Environments. These were reshaped along the concept dimensions recorded in Table 2 and compared with the findings of previous studies outlined in Table 3.

B. Comparison with Previous Research

To cite these results, the research returned to prior research on digital tools and managerial ethical practice. Table 3 is a comparative overview of landmark studies within this space.

Table 3. Summary of Earlier Research

Researcher	Method	Main Findings	Limitations
(Brendel et al., 2021)	Qualitative case study	AI systems may unintentionally enable moral disengagement in managers.	Limited to Western organizations.
(Lehner et al., 2022)	Conceptual analysis	Argued for socio-technical integration in ethical digital management.	Lacked empirical validation.
(Farayola & Amoo, 2024)	Mixed methods	Digital literacy positively influences ethical awareness.	Focused mainly on the finance sector.
(Alavi et al., 2021)	Exploratory interviews	Decision-support systems enhance ethical reasoning transparency.	Did not explore accountability outcomes.
(Tiron-Tudor et al., 2025)	Comparative study	AI analytics improves decision transparency but may weaken moral intuition.	Cross-sector scope still limited.

As proposed in Table 3, earlier work has consistently confirmed that electronic technology does impact ethical sensitivity, but possibly not on a willingness to follow where managers lead, and to capitalize on such impacts in practice. The present study extends these findings by explicitly demonstrating how ethical cognition and socio-technical interaction co-evolve within real managerial decision environments rather than being treated as separate domains.

Theme 1: Electronic Intermediation of Moral Sensitiveness

The first of these threads discusses how computer technology makes managers acutely aware of the ethical dimension by uncovering underlying trends in information. Several participants referenced instances in which analytics dashboards forecasted potential fairness or privacy concerns before decisions were reached. This is echoed by (Brendel et al., 2021; Lehner et al., 2022) to validate that technology can act as an "ethical amplifier." Nevertheless, the participants warned against over-amplifying machine warnings, since it would diminish moral perception, making ethics appear as a checklist rather than a reflective practice. Thus, digital mediation heightens consciousness but at the same time homogenizes ethical sentiment. Moral sensitivity is nowadays externally driven by algorithms rather than developed solely through reflective judgment. This theme directly aligns with the first stage of Ethical Decision-Making Theory (moral awareness), showing that digital tools increasingly shape how ethical issues are initially perceived.

Theme 2: Ethical Reasoning through Data Support

The second topic addresses how information systems assist managers in rationalization and justification of ethical decisions. The attendees showcased dashboards and AI simulations that demonstrated objective accuracy in face-offs with moral dilemmas, such as employee evaluation or resource allocation. In accordance with Alavi et al. (2021), technology serves as reasoning scaffolding, enforcing evidence toward moral justification. Nonetheless, participants noted that

final judgment still entailed contextual interpretation, stressing that technology is an enabling factor but not a substitute for ethical reasoning. This theme is a sign that moral cognition is a blend of data-based insights and human empathy. Ethical reasoning is thus reduced to a competition between system outputs and managerial conscience. This finding reflects the judgment stage of Ethical Decision-Making Theory, where digital rationality and human moral evaluation interact rather than operate independently.

Theme 3: Managerial Responsiveness in AI-Augmented Environments

Theme 3 concerns the evolving notion of responsibility in the use of AI. As technologies became increasingly transparent and traceable, managers were simultaneously empowered and unsettled by the need to assume accountability for outcomes produced by AI. Respondents reported building adaptive accountability processes, including ethical self-reflection, reliance on digital governance norms, and interpretation of algorithmic transparency reports. These findings are supported by (Gherardi & Laasch, 2022), who argue that digital moral accountability requires reflexive rather than purely compliance-based monitoring. Figure 3 provides a socio-technical feedback cycle among digital tools, human judgment, and organizational response. This theme corresponds with the accountability stage of Ethical Decision-Making Theory and reveals how responsibility is redistributed across human-machine systems within socio-technical structures.



Figure 3. Socio-Technical Feedback Loop in Ethical Managerial Decision-Making

As Figure 3 illustrates, ethical decision-making is a recurring learning process in which human judgment and technological systems mutually shape one another. Any given decision not only produces ethical consequences but also reconfigures managerial learning and system parameters. More specifically, digital tools generate ethical signals that influence managerial awareness and judgment, whose outcomes feed back into both organizational learning processes and subsequent

system design, forming a continuous socio-technical learning loop. This feedback structure positions ethical decision-making as an adaptive learning system rather than a single evaluative event.

V. DISCUSSION

Braiding these findings together, digital technology emerges as both an ethical mediator and a cognitive accelerator, reshaping the boundaries of responsibility. Data-driven ethics suggests that managerial decision-making depends less on technology itself and more on how managers interpret and integrate digital signals within moral frames. These empirical findings reinforce Figure 1 (Conceptual Framework) and the operational model presented in Table 2. The socio-technical feedback model derived (see Figure 3) illustrates that managerial ethical decision-making is not linear but circular, adaptive, and situational. Three interconnected patterns were identified: digital technology heightens ethical sensitivity but risks narrowing moral interpretation; evidence-based reasoning improves justification but requires human interpretive balance; and accountability remains fundamentally human despite algorithmic mediation. This condition produces an ethical paradox in which digital mediation simultaneously enhances ethical visibility while potentially weakening deep moral reflection through an over-reliance on algorithmic rationality (Brendel et al., 2021; Tiron-Tudor et al., 2025).

The findings imply that managerial ethical decision-making in the digital era represents a socio-technical adaptation rather than a stable moral routine. Conceptually, this study extends Ethical Decision-Making Theory by embedding digital mediation directly into the stages of awareness, judgment, and accountability. Moral sensitivity, traditionally viewed as an internally driven process, is now increasingly initiated through algorithmic cues and predictive analytics rather than personal deliberation alone (Brendel et al., 2021). Consistent with Socio-Technical Systems Theory, the feedback loop depicted in Figure 3 confirms that organizational ethics is co-constructed by human actors and technological infrastructures. Managers no longer operate in isolation but within a reality shaped by machine learning outputs, peer ethics, and governance mechanisms. This supports the notion of distributed ethical agency, where rationality and responsibility span human-machine boundaries. This finding empirically strengthens prior conceptual arguments that accountability in digital systems is inherently socio-technical and reflexive in nature (Gherardi & Laasch, 2022; Lehner et al., 2022).

Practically, the study highlights that digital ethical capacity must extend beyond procedural compliance. Managers require digital moral literacy to interpret system outputs, identify algorithmic bias, and reflect critically on the role of technology in mediation. Three implications follow. First, ethics-by-design principles should be embedded within decision-support systems so

that ethical dimensions become integral to analytic processes. This aligns with previous evidence that ethical awareness increases when value implications are structurally embedded within digital tools (Farayola & Amoo, 2024). Second, reflexive accountability mechanisms must accompany algorithmic governance to strengthen responsibility through continuous moral monitoring. This supports (Carroll, 2021) view that accountability in technologically mediated environments must be both transparent and dialogical. Third, digital platforms should function as continuous ethical learning systems in which feedback from ethical outcomes reshapes both managerial behavior and algorithmic configurations. Together, these mechanisms operationalize the socio-technical learning cycle illustrated in Figure 3 (Gherardi & Laasch, 2022; Lehner et al., 2022).

At the policy level, these findings call for a redefinition of organizational culture and governance. Ethical accountability must be institutionalized at both human and technological levels through digital ethics boards or AI governance committees. Furthermore, managerial education must integrate data analytics literacy with ethical reasoning to prepare leaders for hybrid decision environments. This responds directly to emerging regulatory and governance concerns surrounding AI-assisted decision-making highlighted by (Tiron-Tudor et al., 2025). Ethical leadership thus evolves from personal moral exemplarity into a form of technological stewardship that guides systems toward fair and transparent decision trajectories.

Finally, the empirical findings validate and operationalize the Conceptual Framework presented in Figure 1. The socio-technical feedback loop in Figure 3 demonstrates how digital tools trigger ethical awareness, shape accountability for decisions, and are subsequently reconfigured through organizational learning processes. This dynamic confirms ethical decision-making in digital organizations as an adaptive governance system rather than a static moral evaluation mechanism (Gherardi & Laasch, 2022; Lehner et al., 2022).

VI. CONCLUSION AND RECOMMENDATION

The study explored how digital technology impacts ethical managerial decision-making by integrating Ethical Decision-Making Theory and Socio-Technical Systems Theory. The study confirms that digital tools are both enablers and disruptors of ethical thought simultaneously. Carefully designed and implemented, they can enhance moral sensitivity, accountability in decision-making, and openness to the firm. However, blindly using technology also holds the threat of an "ethical automation gap," where faith in computerized responses numbs ethical awareness and suffocates human agency. The main contribution of this study lies in its integrative conceptualization of ethical decision-making as a socio-technical learning system, in which digital intelligence and human moral cognition co-evolve rather than operate as separate domains. The Socio-Technical Ethical Decision Framework (Figure 3 below) maps the dynamic interplay

between technology and values in feedback loops, placing digital tools in a facilitative role for ethical thinking rather than as replacements for human judgment.

Practically, the study indicates that organizations need human-focused digital ethics. Organizations are encouraged to adopt ethics-by-design principles by embedding ethical reflection directly into decision-support systems, strengthening reflective governance through continuous algorithmic auditing and ethics committees, and establishing clear AI accountability standards to prevent the diffusion of moral responsibility. This study is limited by its qualitative design and sectoral scope, which constrain the generalizability of the findings. Future research is recommended to adopt longitudinal or mixed-method approaches and examine emerging technologies, such as generative AI, to further refine ethical governance models in digital managerial environments. Lastly, this research confirms that ethical leadership remains fundamentally a human process technologically facilitated, but never replaced within heavily technologized organizations.

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