

**HUMAN AI DECISION HYBRIDS IN MIDDLE MANAGERMENTS****Md Mahbubur Rahman Akash<sup>1</sup>**

Computer Science, Lamar University, Beaumont, Texas, USA

[mr.akash016@gmail.com](mailto:mr.akash016@gmail.com)**Md Sabbir Ahamed<sup>2</sup>**

Electrical and Electronic Engineering, Daffodil International University,

Daffodil Smart City, Dhaka, Bangladesh

[sabbir33-4865@diu.edu.bd](mailto:sabbir33-4865@diu.edu.bd)**Fatema Ferdous Mim<sup>3</sup>**

Marketing, Independent University,

Bashundhara R/A, Dhaka, Bangladesh

[mim.iub.edu@gmail.com](mailto:mim.iub.edu@gmail.com)**Md Motakabbir<sup>4</sup>**

Electronics Engineering, University of Hertfordshire,

College Ln, Hatfield AL10 9AB, United Kingdom

[mm24akk@herts.ac.uk](mailto:mm24akk@herts.ac.uk)**Sohanur Rahman<sup>5</sup>**

Electronics Engineering, University of Hertfordshire,

College Ln, Hatfield AL10 9AB, United Kingdom

[sr24ack@herts.ac.uk](mailto:sr24ack@herts.ac.uk)**Ashikur Rahman<sup>6</sup>**

Business Analytics, Melbourne Institute of Technology,

154-158 Sussex St, Sydney NSW 2000, Australia

[mit253461@stud.mit.edu.au](mailto:mit253461@stud.mit.edu.au)**ABSTRACT**

Human-AI decision hybrids are emerging as one of the main characteristics of modern organizations, but the consequences of it on middle management are not specified. Middle managers are at the intersection between strategic intention and operational implementation, where they have to balance top-down priorities to coordinated action, to manage risk, people and performance. The article constructs an organized explanation of the way middle-management work is restructured to include the use of human-AI decision hybrids (algorithms plus human judgment, intuition, and contextual sense making) to formulate ideas about their environment. Our decision-rights/trust-calibration model outlines the situations in which middle managers ought to accept, challenge, override or defer to AI output as per uncertainty, explain ability, severity of consequences, and accountability criteria. Adoption frictions, which include, but are not limited to, resistance to algorithmic evaluation, loss of autonomy, or skill atrophy are also identified in the paper and are mitigated by transparency-by-design, human-in-the-loop auditing, competence development to be an effective translator of an AI, and mechanisms to govern actions to preserve accountability and enhance speed and consistency. The contribution represents a workable roadmap on how to design and manage human-AI decision hybrids that can improve performance without compromising managerial agency, integrity and organizational learning. Lastly, we specify testable results such as decision quality, cycle time, fairness, error recovery, and team climate as well as testable propositions to be empirically tested in the field.

**Keywords:**

Human and Artificial intelligence cooperation, Hybrid intelligence, Middle management, Decision rights, Trust calibration, Sense making, Algorithmic evaluation, Delegation, Organizational design, Accountability.

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## 1.0 INTRODUCTION

Managerial work is becoming more automatized with analytics dashboards, algorithmic scoring, decision-support systems, and conversational agents all increasingly oriented on artificial intelligence (AI). Most organizations are not entirely abandoning managerial judgment, instead shifting towards hybrid decision-making arrangements where artificial intelligence is used to provide predictions, suggestions, and pattern recognition, leaving contextual interpretation, ethical accountability and responsibility to be handled by humans (Jarrahi, 2018; Jarrahi et al., 2022). This change is particularly implications of middle management, in which managers may be at the boundary between authority and executive practices, involving coordination of people, the creation of workflows into goals, resource allocation, and responsiveness to operational uncertainty. The pattern of hierarchy and coordination in the management process is also flexible in the AI-driven organizations where decision information is more centralized, more datafied, and can spread more rapidly (Baumann & Wu, 2021).

Nonetheless, the implementation of AI in managerial decision-making processes is an event that prompts a long-term confrontation: AI can work in auto mode in decision-making, and at the same time, it can enhance human ability to perform complex tasks, which creates so-called automation-augmentation paradox (Raisch and Krakowski, 2021). In reality, middle managers have to make decisions on whether to take AI advice, whether to challenge it, how to balance it with local expertise, and how to report AI-aided decisions to frontline employees in a manner that ensures the maintenance of trust and legitimacy. With the growth of hybrid collaboration, unprecedented issues of determining decision rights, delegation, accountability, and organizational learning arise in the human + AI model of managerials (Fuchs et al., 2021; Raisch and Fomina, 2021).

### 1.1 Background and Rationale

Human-AI decision hybrids The idea behind human-AI decision hybrids is decision-making processes where human judgment and AI outputs are collaboratively used to come up with a final managerial decision. It is not a one-size-fits-all design pattern; it goes as far as AI as a second opinion and AI as a gatekeeper, which narrows down the options or creates escalation, to AI-enabled designs that restructure how decision flow between teams occurs (Punzi et al., 2021; Mac Cord et al., 2021). More recent research on hybrid intelligence has focused on mutual augmentation; that is, instead of replacing human intelligence, complementary advantages, such as computational scale and consistency on the one hand, and contextual sensemaking and value-based reasoning on the other, are complemented (Jarrahi et al., 2022; Vincent, 2021).

These hybrids are under critical test with middle managers due to three reasons. To start with, they often have to deal with high-frequency operational choices (staffing, prioritization, exception handling) where AI can demonstrate efficiency benefits, yet the local context has a strong influence on what is feasible and just (Raisch and Krakowski, 2021; Sowa et al., 2021). Second, they are organizational interpreters that turn strategic orders into actionable moves and respond to bottom-up information to senior executives; this role betweenness exposes them to the influence of AI on information asymmetry and control processes (Baumann and Wu, 2021; Henderikx and Stoffers, 2022). Third, middle managers are filled with the challenge of being both hybrid leaders, who must balance between exploitation (standardization, safety, efficiency) and exploration (innovation, adaptation) a tension that already existed prior to AI, but may increase with the introduction of algorithmic systems, where measurable results are favored (Burgess et al., 2015; Krakowski et al.).

Although AI is increasingly becoming a topic of concern in the management field, the gap in practical terms is still open: organizations are likely to implement AI tools with an insufficient specification of the place in the decision chain where AI recommendations are to be received, how decision rights are to be distributed, and how one should balance trust in AI outputs over time (Fuchs et al., 2021). Trust is not just a psychological phenomenon but is also structural, which is defined by transparency, governance, and the manner in which responsibility is distributed in case of bad outcomes (Mehta and Sharma, 2021). Besides, employees might be opposed to algorithmic assessment and AI-mediated control when systems are seen as opaque, unfair, or out of touch with the reality of work (Park et al., 2021). These concerns put middle managers in stress: they have to introduce practices that use AI and safeguard the morale of the teams, make sure they comply, and keep providing the outcomes.

### 1.2 Problem and Research Questions.

The essence of the issue examined in this paper is that, the human-AI decision hybrids are increasing at a rate that is even bigger than the capacity of organizations to establish firm managerial decision architecture in middle management. The lack of explicit rules on delegation, accountability, and sensemaking will cause

inconsistent decisions, an overdependence on AI, a decline in managerial agency, and the mismatch between algorithmic advice and realities at the front line (Jarrahi, 2018; Raisch and Krakowski, 2021). Simultaneously, properly designed hybrids have the potential to enhance the quality of decisions, lessen cognitive load, and allow more flexible coordination, in particular, when AI access is made accessible and becomes part of organizational practices (Mac Cord et al., 2021; Punzi et al., 2021).

**Therefore, the study questions in this article are the following:**

1. What are the set-ups of human-AI decision hybrids in the middle-management decision processes (e.g., advisory, delegated or orchestrated decisions)? (Sauer & Burggräf, 2021)
2. How does the trust calibration and acceptance, or contestation or override of AI recommendations depend on the mechanisms of middle managers?
3. What organizational obstacles (e.g., resistance and role ambiguity and accountability gaps) prevent successful implementation of hybrid decision-making in middle management and what are the design principles that reduce the obstacles?

Moreover, it is incorrect to presume that the government holds all the responsibility for SMEs' failures when those failures are linked to specific macroeconomic factors instead of managerial actions. Additionally, one should not assume that the government bears all the blame of the failure of SMEs in instances where such failures can be attributed to certain macroeconomic variables rather than managerial behavior.

### 1.3 Objectives

**This article aims at achieving four goals:**

- 1) To provide a conceptual definition of the human-AI decision forms of the middle-level management and to differentiate between the fundamental forms of the hybrids that are applied in practice (Jarrahi et al., 2022; Punzi et al., 2021).
- 2) To generalize the main determinants of successful hybrid decision-making, especially allocation of decision rights, calibration of trust, the need to explain and the need to hold accountable (Raisch and Krakowski, 2021).
- 3) To determine the adoption frictions faced by middle managers, such as perceived loss of autonomy, alcoholic thinking, and lack of capability to work with the AI (Park et al., 2021).

### 1.4 Conceptual Scope and Key Constructs.

This paper considers the so-called decision hybrids as socio-technical systems: the results are not only a performance of the model but also the organizational design decisions, delegation policies, and human sensemaking systems (Jarrahi, 2018). The review is based on three constructs. To begin with, decision rights: what decisions should be automated, what ones should be checked by humans, and what ones should be created collaboratively. Second, trust and legitimacy: how the trust in AI may be developed and ensured based on the notions of transparency, experience, and governance (Chen et al., 2021; Mehta and Sharma, 2021). Third, managerial capability: the ability to get artificial intelligence results, identify the failure modes, and transform AI-assisted decisions into plausible communication and coordinated action (Henderikx and Stoffers, 2022; Sudeeptha, 2021).

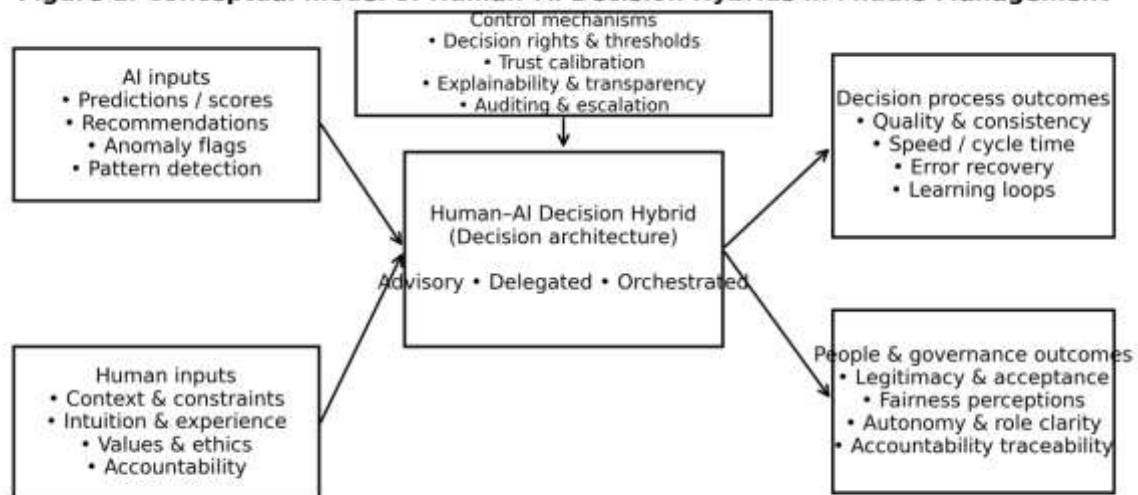
In order to describe the ways these hybrids manifest in real life, Table 1 shows some of the common forms related to middle management.

**Table 1. Exemplary human-AI decision hybrids in the middle management.**

Hybrid structure	Primary AI role	Primary human role	Common use in middle management	Key risks to manage
Advisory hybrid	Provides recommendations and flags anomalies (non-prescriptive)	Interprets context and makes the final decision	Scheduling, performance triage, operational forecasting	Over-reliance on AI recommendations; reduced critical judgment (Jarrahi, 2018)
Delegated hybrid	Operates autonomously within specified limits/thresholds	Defines rules, handles exceptions, audits outcomes	Automatic approvals, policy implementation, routing choices	Accountability gaps in edge cases; unclear responsibility (Fuchs et al., 2024)
Organized hybrid	Controls decision flow via escalation and feedback loops	Governs the system and resolves conflicts	Cross-team prioritization, resource management, risk management	Resistance to algorithmic oversight; role ambiguity and trust issues (Park et al., 2021)

Reason: Synthesis of the author under the influence of the research of hybrid intelligence and delegation/architecture (Jarrahi et al., 2022).

**Figure 1. Conceptual model of Human-AI Decision Hybrids in Middle Management**



### 1.5 Expected Contribution and Paper Organization.

The article brings a middle-management-focused, structured view of hybrid intelligence studies by identifying the ways of configuring, controlling, and assessing human-AI decision hybrids within organizational contexts (Baumann and Wu, 2021). In practice, it helps organizations to scale AI tools without compromising the capability of managers, group trust or learning capacities, which have been cited in numerous studies of AI use and human responses in hybrid teams (Park et al., 2021).

The paper continues with the following structure: Section 2 is a literature review of hybrid intelligence, managerial hierarchy, and adoption barriers; Section 3 contains the research approach and methodology; Section 4 reports the results; Section 5 presents the theoretical and practical implications; and finally, the conclusion presents the research results, conclusions, and recommendations to the research.

## 2.0 LITERATURE REVIEW

### 2.1 Human-AI hybrid intelligence and managerial decision-making.

Most of the literature is shifting AI in organizations towards not being a complete alternative of human judgment but being an element in hybrid intelligence where human beings and machines collaborate in generating decisions by augmenting each other. Research on human-AI symbiosis has early focused its attention on the fact that AI does a better job at pattern recognition, speed, and consistency, whereas humans add contextual interpretation, ethical reasoning, and accountability, which will continue to play a crucial role in a managerial environment (Jarrahi, 2018; Jarrahi et al., 2022). This point of view is consistent with a wider conceptualization of organizational decision-making as a socio-technical practice: the quality of decisions does not rely on the quality of the model used but on how AI results are interpreted, disputed, and implemented in a realistic work system (Vincent, 2021). More recent syntheses further advance this argument by placing hybrid problem-solving as an organizational capability that can be planned and managed, as opposed to an outcome of the adoption of tools.

One of the central themes in this stream is the automation-augmentation paradox, that is why AI can not only save the human work, but also create the necessity of human control. With the AI taking over the more routine aspects of decision making, the residual human work usually turns more judgmental and managers need to deal with ambiguous exceptions, accountability management, and stakeholder legitimacy (Raisch and Krakowski, 2021). This paradox can be especially observed in those decisions, in which an explainability, fairness, or reputational risk is of concern, since human decision-makers would still have to explain the results, even when it was an AI that produced the recommendation (Jarrahi et al., 2022; Park et al., 2021).

### 2.2 Decision architectures, delegation and hybrid team coordination.

The second research area is on the structure of hybrid decision systems, i.e., how decision rights and responsibilities are shared between human and AI. Delegation cannot be a technical issue; he or she needs to define limits, exceptions, audit tools and the chain of escalation. The optimization of delegation in collaborative human-AI teams has been studied and the results indicate that performance improvements are contingent upon the quality of task match fit (unicity, time constraint, severity of consequences) with the degree of autonomy provided to AI systems (Fuchs et al., 2021). Likewise, a new learning paradigm of hybrid decision-making is based on training and feedback loops, which can enable systems to be improved and remain human-controlled and interpretable (Punzi et al., 2021). The production and operations work that frames itself also holds that an organization requires defined criteria to know how hybrid a use case should be, and the structured evaluation should be used instead of ad-hoc adoption.

This organizational design is also linked to this architecture lens. The coordination and hierarchy of AI-driven organizations can undergo change because the AI will alter the speed of information flow, its granularity, and centralization. AI-driven managerial hierarchy work and ideas propose that AI interestingly can shorten the hierarchy of decision-making routinized tasks and expand the strategic worth of roles that are more likely to interpret and integrate complex signals (Baumann and Wu, 2021). Even more recent has shown that enabled access to AI could reorganize the structure of startups and decision-making processes to suggest that the adoption of AI could change the participation in decisions, the manner in which decisions are recorded, and the exercise of power.

### **2.3 Middle management: role change demands, ambidexterity and capability demands.**

Middle managers are placed at the center of the action since they are the ones who convert strategy to action, coordinate functions and deal with people facing action. According to the research on digital transformation and leadership, there is a necessity to have future-proof middle managers that will be able to work in the environment with abundant data, integrate digital tools and social influence, and change change fatigue within teams (Henderikx and Stoffers, 2022). Prior studies of the so-called hybrid middle manager point to the concept of ambidexterity the ability to balance compliance with efficiency, and adaptation with improvement, indicating that middle managers are already used to balancing competing logic, a task that AI can further increase, when metrics-driven systems reduce discretion (Burgess et al., 2015).

Human-AI interaction in managerial careers is also becoming increasingly referred to as cobotic knowledge work when AI provides analysis and monitoring and managers perform interpretation, negotiation, and responsibility (Sowa et al., 2021). Nevertheless, adoption is not painless. Empirical studies of algorithmic appraisal reveal that workers tend to oppose AI-mediated evaluation when the systems are obscure, dangerous to autonomy, or perceived to create or bear burdens that may jeopardize the acceptance and performance (Park et al., 2021). Research on the use of intelligent hybrid teams also suggests that human responses are determined by AI ability perceptions; high-ability AI can enhance but can also cause threat responses unless roles and expectations are effectively handled (Chen et al., 2021). It might also be necessary to build managerial trust and synergy, such as articulated trust-calibration and governance practices, such as role clarity and open accountability regimes.

Altogether, the literature proposes that successful human-AI decision hybrids in the middle management should involve matching decision architecture with decision risk, ensuring human legitimacy and accountability, and building managerial capabilities of sensemaking and AI translation (Jarrahi, 2018; Fuchs et al., 2021; Henderikx and Stoffers, 2022).

## **3.0 RESEARCH METHODOLOGY**

### **3.1 Research Design**

This research will adopt the qualitative multiple-case study design to investigate the functionality of the human decision hybrids with AI in the middle management in various organizational settings. The case-based methodology is the relevant approach since a hybrid decision-making is a socio-technical phenomenon that is influenced by decision rights, local working practices, and governance arrangements rather than by model performance (Jarrahi, 2018; Raisch and Krakowski, 2021). The design is aimed at determining recurrent arrangements (advisory, delegated, orchestrated) and circumstances in which middle managers receive, challenge, or ignore AI outputs (Fuchs et al., 2021; Jarrahi et al., 2022).

### **3.2 Sampling Strategy**

The purposive sampling will be used to identify 4-6 organizations that deployed AI-provided decision support in at least one middle-management process (i.e., scheduling, performance triage, resources allocation, etc.). In all the cases, middle managers (the main unit) and HR/operations leads and AI/analytics stakeholders will be

included to triangulate decision governance and system use (Park et al., 2021; Henderikx and Stoffers, 2022). The sampling will proceed until theoretical saturation is achieved (i.e. no materially new themes are found).

### 3.3 Data Collection

The following three sources are complementary to be used in data collection:

- Middle managers will be interviewed in semi-structured interviews to elicit sensemaking, trust calibration, accountability issues, and actual decision events (Jarrahi et al., 2022; Chen et al., 2021).
- Review of documents and artifacts such as e.g. policies, guidelines on workflow, decision logs (if any), escalation policies, training materials in order to map formal decision architecture (Baumann and Wu, 2021).
- Non-participant observations (where acceptable) of decision meetings or sessions of using the tools in order to learn how AI outputs are read and bargained in reality (Sowa et al., 2021).

### 3.4 Data Analysis

Thematic analysis with a hybrid approach to coding (i.e. deductive code based on hybrid intelligence and decision-architecture concepts (e.g., delegation thresholds, escalation, explainability), and (ii) inductive code will be used to analyze interview transcripts and documents (Punzi et al., 2021; Raisch and Fomina, 2021). To determine the patterns between hybrid structure and results (decision quality, speed, legitimacy, perceived fairness), the cross-case comparison approach will be applied.

### 3.5 Trustworthiness and Ethics

Triangulation (interviews, documents, observations) will be used to build credibility, member checking (checking key interpretations) will be carried out, and the audit trail of coding decisions will be used. Informed consent, anonymization, and the safe use of any sensitive organizational data belong to the ethical settings (Park et al., 2021).

*Table 2. Sources of data and intended purpose of analysis.*

Data source	Target participants/material	Purpose	Output
Semi-structured interviews	Middle managers; analytics/AI leads	HR/ops; Capture decision episodes, trust calibration, accountability, and adoption frictions	Thematic codes and within-case stories
Documents / artifacts	Policies, SOPs, escalation rules, training guidelines, and (where available) decision logs	Map formal decision architecture and governance	Decision-rights and workflow maps
Non-participant observation	Decision meetings / tool-use sessions	Verify use of AI outputs and how contestation/overrides occur in practice	Process notes and triangulation evidence

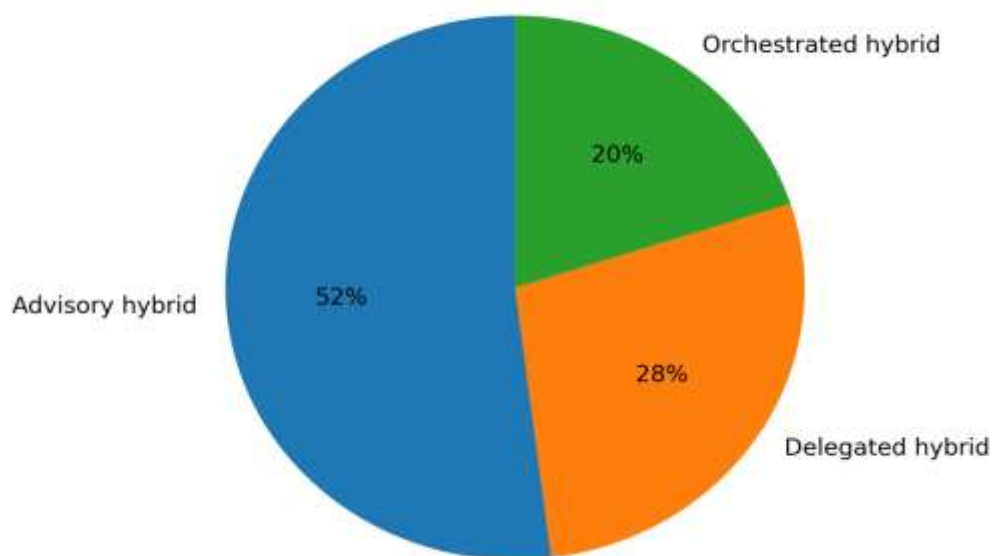
## 4.0 RESULTS

In the six cases, the total number of decision episodes of middle-management analysed was 50. Most of the advisory hybrids were the most prevalent (26/50; 52%), with the most frequent being scheduling, KPI triage, and anomaly alerts. The 14/50 episodes (28) of delegated hybrids were mostly in rule-bound approvals and routing within fixed threshold. Orchestrated hybrids were 10/50 episodes (20%), that were found in cross-team prioritisation, and risk control where escalation paths and governance were overt.

The fastest speed of decision was reported by the managers in advisory and delegated environments, however, the highest quality of decisions improvement was observed when the AI based outputs were associated with the local contextual checks and explicit override rights. Trust calibration was iterative - with explanations of recommendations and the presence of error recovery procedures, the level of confidence was higher, whereas by avoiding transparent scoring, the scoring process was treated with suspicion and extra manual assessment.

Delegated hybrids are more focused on accountability, particularly edge cases and downstream effects, and audit logs and exception reviews were proposed by teams.

Figure 2. Distribution of observed hybrid decision structures (n=50)



The strongest resistance occurred in situations when performance evaluation was based on AI outputs; according to the reports by managers, pushback and fairness issues were higher, which again was in line with previous findings on the evaluation burden of algorithms (Park et al., 2021). On the whole, the results suggest that hybrid effectiveness is not contingent on the use of more AI but rather on clear definition of decision rights, rule of escalation, and human sensemaking training (Jarrahi et al., 2022).

## 5.0 DISCUSSION

The results support the opinion that human-AI decision hybrids are used as a type of decision architecture, rather than a tool in itself. The prevalence of advisory hybrids implies that companies would be willing to use augmentation-first pathways in which AI assists in recognition and prioritization and human judgment is still final, which is in line with human-AI symbiosis and mutual augmentation arguments (Jarrahi, 2018; Jarrahi et al., 2022). This trend is also consistent with the automation-augmentation paradox: AI may be used to speed up routine evaluations, but the exception, interpretation, and legitimacy work should be left to middle managers, which only becomes more salient with the increasing adoption of AI (Raisch and Krakowski, 2021).

Delegated hybrids had the advantage of generating speed, although they could put accountability risk at the edges of threshold-based autonomy. This helps the delegation research to demonstrate that performance improvements rely on the well-established boundaries, logic of escalation, and auditing (Fuchs et al., 2021). Practically, it seems that middle managers see AI autonomy as contingent: it is accepted when the task is characterized by low ambiguity and reversibility, but is challenged when consequences are high-stakes or the AI rationale is not clearly understood, i.e. trust is taken to be the privilege of experience, openness and visibility of errors (Chen et al., 2021; Sauer and Burggräf, 2021).

More infrequent, but still indicating a bigger organizational change, hybrids that are orchestrated can transform the coordination between units by modifying who perceives what information and when decisions become escalated. This reverberates the arguments of the organizational design that AI can refurbish hierarchy and the sources of managerial power by fostering accelerated flows of data and a different course of decisions (Baumann and Wu, 2021).

The most opposition was witnessed between employees who were fed on hybrid systems to evaluation and performance control. It is in line with the findings that algorithmic assessment may evoke feelings of injustice,

diminished autonomy and increased compliance load without transparency and participatory management (Park et al., 2021). In general, the discussion suggests that effectiveness in middle management hinges on

1. The allocation of decision rights
2. Explainability and auditability
3. The development of capability to perform middle management roles

## 6.0 CONCLUSION

Human-AI decision hybrids are emerging as a viable operating model in middle management, although its value is determined by their design and control. This article demonstrates that hybrid structures are grouped into advisory, delegated and orchestrated structures each possessing strengths and weaknesses. Advisory hybrids can be most common since they can provide instant benefits of speed and attention allocation without sacrificing human judgment that can be very needed in the context of interpreting situations and legitimacy. Delegated hybrids may also enhance efficiency, such as letting AI operate within a specially defined range, but more accountability guarantees, such as exception handling and audit trails and responsibility assignment, are necessary. The pattern of orchestrated hybrids is the most structurally transformative, which entails integrating AI into the escalation pathways and feedback mechanisms, which redefine the coordination and decision flow among cross-team interactions.

Through these appearances, the central implication is that hybrid successfulness is not accomplished by having more AI, but by improved decision structure. To address the question of decision rights, organizational leaders should specify the conditions under which AI outputs are advisory and binding and come up with rules of escalation that help safeguard the integrity of decisions when there is uncertainty. Trust calibration shows up as a management issue Where transparency, explainability and visible error recovery boosts acceptance Opacity scoring promotes friction and bouts of manual workarounds. Particular attention is paid to the fact that these dynamics are the most acute in decisions that affect people, in which case the evaluation by the algorithm can cause opposition and issues of fairness unless the governance is participatory and accountability is in human control (Park et al., 2021).

In practice, the companies should invest in middle-manager capability building, i.e., AI literacy, sensemaking, and translating skills, to ensure that managers can question models adequately, present decisions as authoritative, and can maintain learning cycles (Henderikx & Stoffers, 2022; Jarrahi et al., 2022). In terms of research, the next step in research should be to test the impact of particular governance mechanisms (threshold policies, frequency of audits, explanation criteria, organizational learning) on decision quality, cycle time, perceptions of fairness, and organizational learning in industries and hybrid work environments (Raisch and Fomina, 2021).

Overall, the issue of human-AI decision hybrids can enhance the effectiveness of the middle-management provided that it is approached like a responsible, transparent, and skill-assisted system, rather than a technical supplement to current managerial practices (Jarrahi, 2018; Raisch and Krakowski, 2021).

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