



Middle-Manager Sensemaking During Artificial Intelligence Transformation

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Abstract

Artificial intelligence transformation alters more than organizational technology. It modifies decision authority, occupational boundaries, information flows, performance expectations, supervisory practices, and employees' understanding of how work should be performed. Middle managers occupy a particularly consequential position during this transition because they must simultaneously interpret strategic AI initiatives communicated by senior leadership and translate those initiatives into operational meaning for employees. Yet much of the discussion surrounding organizational artificial intelligence adoption emphasizes technical capability, executive strategy, employee acceptance, or algorithmic performance while giving comparatively limited attention to the interpretive work conducted by middle managers. This study develops a sensemaking-centered framework for examining how middle managers respond to ambiguity during organizational AI transformation.

A simulation-based explanatory design is used because no primary organizational dataset was supplied. The analytical framework represents AI transformation through five stages—awareness, interpretation, experimentation, integration, and stabilization—and evaluates changes in ambiguity, role clarity, trust calibration, communication translation, and overall sensemaking effectiveness. The simulated results indicate that the sensemaking effectiveness index increases from 48 during the awareness phase to 84 during stabilization, while organizational ambiguity declines as managerial interpretation, contextual translation, and experience with AI-supported work accumulate.

The findings suggest that middle managers should not be treated merely as implementation conduits. They operate as interpretive intermediaries who connect technological capability with organizational context, mediate employee concerns, identify contradictions between algorithmic recommendations and operational realities, and shape whether AI transformation is understood as displacement, surveillance, augmentation, or organizational learning. The study contributes a structured framework for integrating sensemaking theory with AI-enabled organizational change and proposes that successful transformation depends not only on technological readiness but also on the organization's capacity to develop interpretive capability at the middle-management level.

Keywords: artificial intelligence transformation, middle managers, organizational sensemaking, digital transformation, human–AI collaboration, managerial interpretation, organizational change, algorithmic management



1. Introduction

Artificial intelligence has increasingly entered organizational processes concerned with forecasting, resource allocation, customer service, performance monitoring, risk assessment, knowledge discovery, scheduling, and managerial decision support. Its organizational significance extends beyond automation because AI systems can redistribute information, alter occupational expertise, reshape authority, and introduce new forms of algorithmically mediated coordination. Faraj, Pachidi, and Sayegh describe learning algorithms as organizationally consequential partly because their operation may involve black-boxed performance, extensive digitization, anticipatory quantification, and less visible political implications. Jarrahi similarly emphasizes the potential complementarity of human judgment and computational intelligence in organizational decision making rather than treating AI exclusively as a replacement technology.

The resulting transformation is frequently characterized by ambiguity. Employees may understand an AI initiative as an opportunity for improved decision quality, a threat to professional autonomy, a mechanism of surveillance, a source of job displacement, or simply another technology that will eventually disappear. Managers may themselves be uncertain about algorithmic reliability, accountability, decision rights, changing job boundaries, and the extent to which employees should accept or challenge AI-generated recommendations. Sensemaking theory is particularly relevant to such circumstances because sensemaking concerns the processes through which organizational actors interpret events that are novel, confusing, ambiguous, or inconsistent with prior expectations. Maitlis and Christianson identify this interpretive process as central to understanding how organizational actors construct workable meanings around disruptive events.

Middle managers are strategically positioned within this interpretive environment. They operate between senior leadership, which may frame AI adoption through enterprise-level objectives, and frontline employees, who encounter its implications in everyday work. Balogun and Johnson demonstrate that middle managers do not simply receive change; their interpretations evolve through interaction and can materially influence how organizational restructuring is understood. Lüscher and Lewis further show that managers confronted with organizational transformation must often work through contradictory demands and paradoxical expectations rather than merely execute predetermined instructions.

This interpretive role becomes more demanding during AI transformation because the technology itself may continue to change after implementation. Algorithmic recommendations can challenge established expertise, create new performance visibility, reorganize workflows, and redistribute control. Kellogg, Valentine, and Christin show that algorithmic technologies may reshape organizational control through multiple mechanisms, demonstrating that technology-mediated management has consequences for power and worker autonomy as well as operational efficiency. Vial's analysis of digital transformation likewise positions technological disruption within broader organizational responses involving structures, value creation, capabilities, and organizational barriers.

Against this background, the present study examines middle-manager sensemaking during artificial intelligence transformation. Rather than assessing AI adoption exclusively through technical performance or employee acceptance, the paper conceptualizes middle managers as interpretive intermediaries whose actions connect strategic intention with operational understanding. Because no real

organization-level dataset has been supplied, the study uses an explicitly simulated analytical framework. Its purpose is not to represent observed behavior in a particular organization but to develop and evaluate theoretically grounded relationships that can subsequently be tested through empirical research.

2. Objectives of the Study

2.1 Understanding the Interpretive Role of Middle Managers

The first objective is to examine how middle managers construct practical meaning when organizational AI initiatives introduce uncertainty concerning tasks, roles, authority, expertise, and employment expectations. The study treats sensemaking as a dynamic managerial capability rather than a single communication event. Managers may initially have incomplete information, revise their interpretations as implementation proceeds, and subsequently communicate revised meanings to employees.

This objective therefore moves beyond the assumption that organizational meaning originates exclusively with senior executives. Middle managers can compare strategic narratives with operational experience, identify contradictions, question unrealistic expectations, and explain technological changes in language that employees can connect to everyday work. Their position gives them access to both strategic information and local operational knowledge, creating an important interpretive bridge.

2.2 Assessing Sensemaking Across AI Transformation Stages

The second objective is to evaluate how managerial sensemaking may evolve across successive phases of AI transformation. The study distinguishes awareness, interpretation, experimentation, integration, and stabilization rather than treating implementation as a single event. This temporal approach recognizes that organizational ambiguity and managerial understanding are unlikely to remain constant during transformation.

The analytical model consequently examines whether increasing exposure to AI-supported workflows is associated with stronger role clarity, more calibrated trust, improved communication translation, and greater overall sensemaking effectiveness. The purpose is to identify where middle-manager interventions may become especially important during the transformation process.

2.3 Developing an Organizational Sensemaking Framework for AI Transformation

The third objective is to integrate organizational sensemaking theory with literature on AI-enabled work and digital transformation. Existing theories provide strong explanations of strategic change and managerial interpretation, while emerging organizational AI research highlights altered expertise, control, decision making, and human–technology relationships. Bringing these literatures together provides a basis for understanding the social interpretation of AI transformation.

The resulting framework is intended to support future empirical studies examining middle managers through interviews, longitudinal case studies, organizational surveys, digital ethnography, or mixed-method designs. It also provides organizations with a conceptual basis for incorporating interpretive readiness into transformation planning rather than relying solely on technical implementation capability.

3. Review of Literature

3.1 Organizational Sensemaking and Strategic Change

Sensemaking scholarship explains how organizational actors construct plausible understandings when established interpretive frameworks become insufficient. Gioia and Chittipeddi's work on strategic change distinguished sensemaking from sensegiving and demonstrated how organizational transformation involves reciprocal processes of understanding and influencing meaning. Weick, Sutcliffe, and Obstfeld later emphasized that sensemaking converts uncertain circumstances into comprehensible situations that can support organized action.

Maitlis and Christianson's extensive review further establishes that novelty, ambiguity, disruption, and violated expectations can trigger sensemaking. This observation is directly relevant to AI transformation because employees and managers may encounter technologies whose outputs, capabilities, and organizational consequences remain uncertain. Sensemaking is therefore particularly important when no stable interpretive template exists for determining whether technological change represents assistance, control, replacement, opportunity, or risk.

3.2 Middle Managers as Change Intermediaries

Middle managers have frequently been portrayed as important participants in strategic change because their responsibilities extend beyond administrative implementation. Balogun and Johnson's longitudinal examination of organizational restructuring demonstrated that middle managers developed and revised interpretive schemas while interacting with others during change. Their findings challenge linear models in which executives define change and lower organizational levels simply implement it.

Lüscher and Lewis similarly demonstrate that organizational change can generate persistent paradoxes requiring managerial interpretation. Middle managers may simultaneously be expected to promote efficiency and experimentation, retain control while empowering employees, or implement standardized technology while responding to localized circumstances. During AI implementation, comparable contradictions arise when managers must encourage algorithmic use while preserving professional judgment, increase data-driven consistency without eliminating contextual discretion, and communicate organizational confidence while acknowledging technological limitations.

3.3 Artificial Intelligence, Work, and Organizational Transformation

Organizational AI introduces interpretive challenges because algorithms may alter how decisions are produced, evaluated, and monitored. Jarrahi argues that human intelligence and AI can provide complementary capabilities in organizational decision making, particularly where analytical processing must coexist with intuition and contextual understanding. Faraj, Pachidi, and Sayegh similarly emphasize that learning algorithms possess organizational characteristics capable of reshaping expertise, work practices, occupational boundaries, and coordination.

Digital transformation research provides an additional organizational perspective. Vial conceptualizes digital transformation as a process in which digital technologies create disruptions that stimulate strategic responses and structural changes. Meanwhile, Kellogg, Valentine, and Christin demonstrate that algorithmic technologies can transform organizational control by allowing new forms of recording, rating, recommendation, restriction, reward, and replacement. Taken together, these

contributions indicate that successful AI adoption cannot be understood solely as the technical installation of computational systems. It constitutes a broader reorganization of meaning, authority, routines, expectations, and relationships.

4. Research Methodology

4.1 Research Design

The study adopts a simulation-based explanatory research design. This design was selected because no primary employee survey, interview dataset, organizational records, or experimentally observed AI-transformation data were provided. Accordingly, all quantitative values reported in this paper are synthetic and are used exclusively to demonstrate the proposed theoretical model. They should not be interpreted as estimates of any identified organization or employee population.

The simulation represents AI transformation through five sequential analytical stages: awareness, interpretation, experimentation, integration, and stabilization. Five principal constructs are considered: perceived ambiguity, role clarity, trust calibration, communication translation capability, and overall managerial sensemaking effectiveness. The model assumes that experience, feedback, dialogue, and increasing familiarity with AI-supported workflows progressively improve managers' ability to construct and communicate plausible interpretations.

4.2 Construct Operationalization and Simulation Logic

Sensemaking effectiveness was represented through a standardized 0–100 index combining four positive dimensions: interpretive coherence, role clarification, calibrated understanding of AI capability, and translation of strategic objectives into operational meaning.

Organizational ambiguity was represented separately as a declining index in order to examine whether stronger sensemaking coincided conceptually with reduced uncertainty.

Table 1: Operationalization of the Simulation Framework

Construct	Analytical Meaning	Scale	Expected Direction During Transformation
Organizational Ambiguity	Uncertainty regarding AI purpose, roles, accountability, and consequences	0–100	Decrease
Role Clarity	Managerial understanding of changing responsibilities and decision authority	0–100	Increase
Trust Calibration	Ability to distinguish appropriate reliance from overreliance or excessive skepticism	0–100	Increase
Communication Translation	Ability to explain strategic AI initiatives in operationally meaningful terms	0–100	Increase



Construct	Analytical Meaning	Scale	Expected Direction During Transformation
Sensemaking Effectiveness	Composite capacity to interpret, contextualize, communicate, and revise meaning	0–100	Increase

Source: Author-developed simulation framework. No real employee or organizational observations were used.

The simulated scores were constructed to represent theoretically plausible movement rather than empirically estimated population parameters. For this reason, the analysis emphasizes patterns, conceptual relationships, and managerial implications rather than inferential statistical significance. This methodological distinction is important because reporting conventional significance tests for deliberately constructed synthetic scores could create an inappropriate impression of empirical validation.

4.3 Analytical Procedure and Evaluation Criteria

The analytical procedure consisted of three stages. First, each AI transformation phase was assigned internally coherent values for ambiguity, role clarity, trust calibration, communication translation, and overall sensemaking effectiveness. Second, cross-stage comparisons were conducted to determine whether managerial interpretive capacity increased as transformation progressed. Third, the simulated pattern was evaluated against theoretical expectations derived from organizational sensemaking and AI-work literature.

Evaluation focused on directional coherence rather than hypothesis testing. A meaningful pattern was defined as one in which increasing managerial experience with AI transformation corresponded with declining ambiguity and increasing clarity, trust calibration, communicative translation, and sensemaking effectiveness. The framework can subsequently be converted into an empirical survey or longitudinal case-study design for validation using actual organizational evidence.

5. Analysis

5.1 Evolution of Managerial Interpretation Across Transformation Phases

The simulation indicates a clear transition from high ambiguity and relatively weak interpretive capacity during early AI awareness toward greater clarity and more effective sensemaking during organizational stabilization. During the awareness stage, the sensemaking effectiveness score is only 48, while ambiguity remains high at 78. This pattern reflects an environment in which managers have received signals of technological change but possess limited direct experience with its practical implications.

As experimentation and integration develop, managers gain access to operational evidence that allows strategic promises to be compared with actual AI behavior. Role clarity, communication capability, and trust calibration consequently increase. By stabilization, the simulated sensemaking effectiveness index reaches 84 and ambiguity falls to 42.

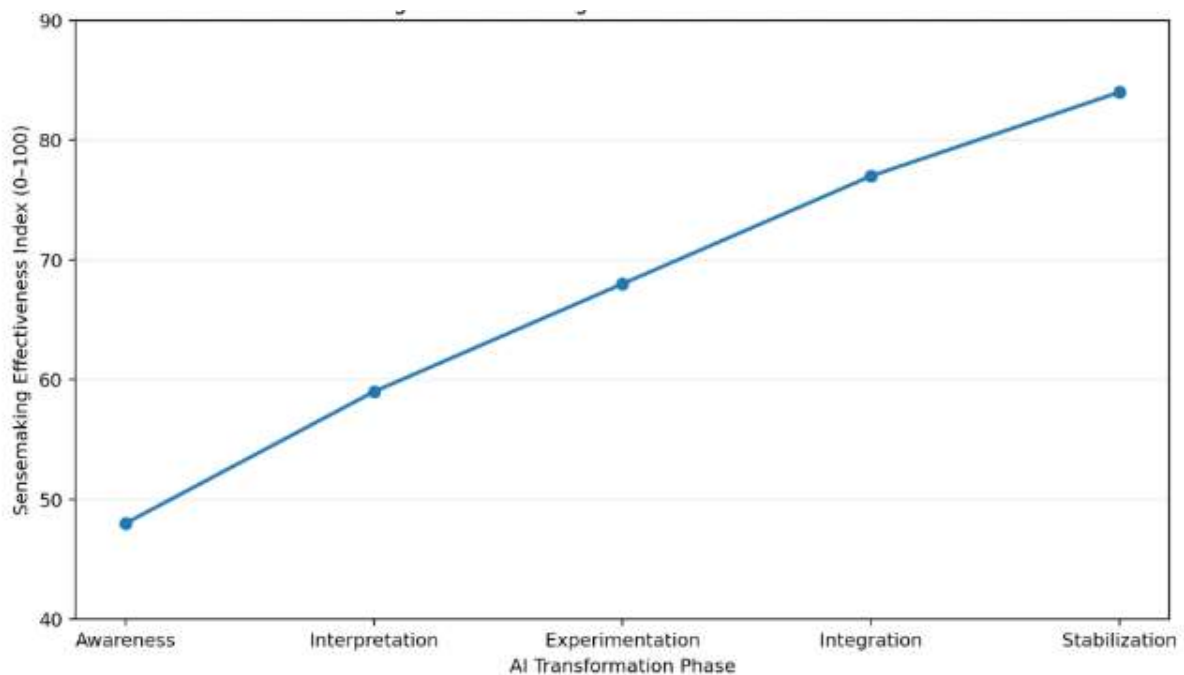
Table 2. Simulated Middle-Manager Sensemaking Across AI Transformation

AI Transformation Phase	Ambiguity Index	Role Clarity	Trust Calibration	Communication Translation	Sensemaking Effectiveness
Awareness	78	46	44	50	48
Interpretation	70	57	55	61	59
Experimentation	61	66	64	70	68
Integration	50	76	72	80	77
Stabilization	42	83	79	86	84

5.2 Sensemaking Effectiveness During AI Transformation

The graphical pattern shows steady improvement in the simulated managerial sensemaking index, increasing from 48 during awareness to 59 during interpretation, 68 during experimentation, 77 during integration, and 84 during stabilization. The largest practical implication of this pattern is that organizational understanding should not be expected to emerge immediately after an AI strategy is announced. Interpretive competence develops through repeated interaction with technology, employees, operational evidence, and organizational feedback.

Graph 1: Simulated Middle-Manager Sensemaking Effectiveness Across AI Transformation Phases





Key finding: Sensemaking effectiveness increases by 36 index points between the awareness and stabilization stages, indicating a simulated improvement of 75% relative to the initial index value. This should be understood as a model-generated relationship rather than an empirical organizational estimate. The progression also indicates why premature evaluation of AI transformation may be misleading. Organizations evaluating implementation during the awareness or early interpretation stage may interpret confusion as resistance or conclude that managerial readiness is insufficient.

Yet some ambiguity is structurally inherent when technological consequences remain uncertain. The more important managerial question is whether the organization establishes mechanisms through which uncertainty can be discussed, investigated, and progressively converted into actionable understanding.

5.3 Relationship Between Sensemaking, Trust, and Role Clarity

The simulation suggests that sensemaking effectiveness increases alongside both role clarity and calibrated trust. This relationship is theoretically important because trust in AI should not be interpreted simply as maximum confidence in algorithmic output. Appropriate trust requires managers to understand what a system can do, where its outputs require verification, and when human judgment should override or complement automated recommendations. Jarrahi's human–AI complementarity perspective supports the importance of combining computational and human strengths rather than assuming automatic substitution.

Role clarity is equally significant. AI can blur traditional distinctions between decision maker, analyst, supervisor, domain expert, and system operator. If managers cannot explain who remains accountable for AI-assisted decisions, organizational uncertainty may persist even when technical performance is strong. Effective sensemaking therefore requires both technological interpretation and institutional clarification regarding decision rights, responsibility, escalation, and human oversight.

6. Discussion

6.1 Middle Managers as Interpretive Infrastructure

The study positions middle managers as part of the interpretive infrastructure through which AI transformation becomes organizationally meaningful. Their role cannot be reduced to transmitting instructions from executives to employees. They observe how technological expectations interact with operational constraints and therefore occupy a position from which contradictions can be identified before they become institutionalized.

This interpretation is consistent with Balogun and Johnson's demonstration that middle managers actively construct meaning during organizational transformation rather than functioning as passive change recipients.

This perspective also alters how managerial readiness should be conceptualized. Traditional technology-readiness assessments often emphasize skills, infrastructure, data, or system adoption. A sensemaking perspective adds interpretive readiness: the capacity to understand ambiguous technological events, communicate uncertainty without amplifying fear, connect strategic objectives to local practices, and revise initial explanations when new evidence becomes available. Such capability



becomes particularly important when AI implementation produces outcomes that were not anticipated during strategic planning.

6.2 Managing the Tension Between Algorithmic Authority and Human Judgment

AI transformation can generate a persistent tension between algorithmic authority and managerial discretion. Where AI recommendations are perceived as objective or scientifically superior, managers may feel pressured to defer to outputs even when local knowledge suggests caution. Conversely, excessive skepticism may prevent employees from benefiting from legitimate computational capabilities. Effective middle-manager sensemaking therefore requires neither unconditional acceptance nor automatic resistance.

Kellogg, Valentine, and Christin's analysis demonstrates that algorithms can become mechanisms through which work is directed, evaluated, restricted, and rewarded. This makes managerial interpretation inseparable from questions of organizational control. Middle managers consequently require the authority to question problematic outputs, communicate limitations, identify unintended behavioral consequences, and escalate situations where algorithmic recommendations conflict with professional, ethical, or operational requirements.

6.3 Communication, Employee Meaning, and Transformation Sustainability

The simulation highlights communication translation as a central component of sensemaking effectiveness. Strategic descriptions of AI frequently employ abstract language concerning innovation, efficiency, productivity, intelligent automation, or data-driven transformation. Such language may be insufficient for employees concerned with concrete questions: Which tasks will change? Who will make final decisions? How will performance be measured? Will professional judgment remain relevant? What happens when the system is wrong?

Middle managers can translate enterprise-level AI narratives into contextually relevant answers. Gioia and Chittipeddi's distinction between sensemaking and sensegiving is useful here because managers first need to develop their own understanding and subsequently influence how others interpret change. Sustainable transformation therefore depends on dialogue rather than one-way communication. Employees must be able to raise contradictions, report unexpected consequences, challenge unrealistic assumptions, and contribute local expertise to the continuing interpretation of AI-supported work.

7. Conclusion

Artificial intelligence transformation creates organizational ambiguity because it can simultaneously affect technology, work design, expertise, authority, accountability, professional identity, and managerial control. This study has argued that middle managers occupy a distinctive position within this environment. They interpret senior-management intentions, observe frontline consequences, mediate competing narratives, and translate technological change into practical organizational meaning. Their contribution is therefore not peripheral to AI transformation but potentially central to whether technological implementation becomes operationally coherent.

The simulation-based analysis demonstrates a theoretically plausible progression in which managerial sensemaking effectiveness increases from 48 during initial awareness to 84 during



stabilization, while ambiguity declines from 78 to 42. These results are intentionally illustrative rather than empirical. Their value lies in clarifying the expected relationship between accumulated organizational experience and stronger interpretation, role clarity, calibrated trust, and communicative translation.

The study also suggests that AI readiness frameworks should incorporate interpretive capability alongside technological and data capabilities. Organizations can possess sophisticated algorithms yet experience weak transformation when managers cannot explain changing decision rights, resolve contradictions, calibrate reliance on automated recommendations, or connect strategic ambitions with operational realities. AI governance should consequently provide middle managers with adequate information, opportunities for experimentation, escalation pathways, cross-functional dialogue, and sufficient discretion to contextualize technological outputs.

Future empirical research should test the framework through longitudinal studies involving organizations at different stages of AI adoption. Interviews with middle managers, employees, senior executives, technology specialists, and governance professionals could reveal how interpretations change over time and which organizational conditions strengthen or constrain managerial sensemaking. Such evidence would permit researchers to determine whether interpretive capability predicts employee trust, responsible AI use, implementation persistence, change acceptance, and organizational learning. Until such validation is undertaken, the present contribution should be understood as a theoretically grounded simulation framework for studying the human interpretive processes underlying organizational AI transformation.

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