

Algorithmic Trust in Managerial Decision-Making

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ABSTRACT

The rapid adoption of artificial intelligence (AI), machine learning (ML), and data-driven decision support systems has transformed managerial decision-making across organizations. Algorithmic systems now assist managers in forecasting demand, evaluating employee performance, identifying financial risks, optimizing supply chains, and supporting strategic planning. Despite these technological advancements, the effectiveness of algorithm-assisted decisions largely depends on the degree of trust managers place in these systems. Algorithmic trust refers to the confidence that managers have in the accuracy, transparency, fairness, and reliability of algorithmic recommendations. Excessive trust may lead to algorithmic overreliance, while insufficient trust may result in the underutilization of valuable analytical insights. Therefore, understanding the determinants and outcomes of algorithmic trust has become an important research concern in management studies.

This paper examines the concept of algorithmic trust in managerial decision-making by reviewing relevant literature and proposing a conceptual framework that explains how algorithm transparency, perceived accuracy, explainability, organizational culture, and technological competence influence managerial trust and subsequent decision quality. A quantitative research methodology is proposed using structured questionnaires and Structural Equation Modeling (SEM). The study contributes to management literature by identifying research gaps and providing theoretical and practical implications for organizations seeking to implement AI-enabled decision support systems effectively. The findings are expected to assist managers in balancing human judgment with algorithmic intelligence while promoting ethical and trustworthy AI adoption.

Keywords: Algorithmic Trust, Artificial Intelligence, Managerial Decision-Making, Explainable AI, Decision Support Systems, Organizational Trust, Machine Learning, Technology Acceptance, Decision Quality, Digital Transformation

INTRODUCTION

The emergence of Artificial Intelligence (AI) and machine learning has fundamentally changed the way organizations collect, process, and interpret information for managerial decision-making. Traditional management decisions were largely based on human experience, intuition, and historical knowledge. However, modern organizations increasingly depend on algorithmic systems capable of analyzing large datasets, identifying hidden patterns, and generating predictive recommendations with remarkable speed and precision. From finance and healthcare to manufacturing and retail, AI-supported systems assist managers in making operational, tactical, and strategic decisions. As organizations continue their digital transformation journeys, algorithmic recommendations have become an integral component of managerial processes.

Although algorithmic systems often demonstrate superior analytical capabilities compared to human judgment in structured environments, their successful implementation depends on managerial trust. Managers frequently question whether algorithmic outputs are accurate, transparent, unbiased, and aligned with organizational objectives. Trust becomes particularly critical when decisions involve uncertainty, ethical considerations, or significant organizational consequences. Researchers have emphasized that managers neither completely accept nor completely reject algorithmic recommendations; instead, they continuously evaluate algorithmic credibility based on transparency, explainability, previous experience, and organizational culture. Therefore, understanding the factors influencing algorithmic trust has become essential for improving managerial effectiveness, organizational performance, and responsible AI adoption.

LITERATURE REVIEW

Trust has long been recognized as a fundamental element of organizational behavior and managerial effectiveness. Mayer, Davis, and Schoorman (1995) proposed one of the most influential models of organizational trust, suggesting that trust is primarily determined by perceptions of ability, benevolence, and integrity. Although originally developed for interpersonal relationships, this framework has increasingly been extended to technology-mediated environments where intelligent systems function as organizational partners rather than simple computational tools. Recent developments in AI have transformed trust from an interpersonal phenomenon into a human-technology interaction issue.

Studies on algorithmic decision-making indicate that individuals often demonstrate either algorithm aversion or algorithm appreciation depending on contextual factors. Dietvorst, Simmons, and Massey (2015) found that people tend to reject algorithmic recommendations after observing even minor algorithmic errors despite recognizing their superior average performance. Conversely, Logg, Minson, and Moore (2019) reported evidence of algorithm appreciation in situations where users perceive algorithms as objective and data-driven. These contrasting findings suggest that trust in algorithms is dynamic and influenced by user experience, task complexity, perceived competence, and organizational context.

Technology Acceptance Model (Davis, 1989) and Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003) provide additional insights into algorithm adoption. Perceived usefulness, ease of use, facilitating conditions, and social influence significantly affect managerial acceptance of AI-based systems. More recent literature highlights explainable AI (XAI) as a critical determinant of trust because transparent algorithms enable managers to understand the rationale behind recommendations. Explainability reduces uncertainty, increases perceived fairness, and strengthens accountability, thereby improving decision confidence. Consequently, organizations increasingly emphasize transparent AI governance, ethical standards, and human oversight when deploying intelligent decision support systems.

RESEARCH GAP

Existing literature has extensively examined AI adoption, technology acceptance, and organizational trust; however, limited research specifically investigates algorithmic trust within managerial decision-making contexts. Most studies focus on technical accuracy or consumer behavior rather than managerial reliance on AI-generated recommendations. Furthermore, previous research frequently examines algorithm transparency, explainability, or fairness independently instead of integrating these variables into a comprehensive managerial trust framework.

Another significant gap concerns the relationship between algorithmic trust and decision quality. Few empirical studies have investigated how organizational culture, managerial technological competence, and explainability jointly influence trust and subsequent decision effectiveness. Additionally, research conducted in developing economies remains relatively limited despite the increasing adoption of AI technologies. Therefore, this study seeks to bridge these theoretical and contextual gaps by proposing an integrated conceptual model suitable for organizational decision-making environments.

RESEARCH OBJECTIVES

The primary objective of this research is to examine the factors influencing algorithmic trust among managers using AI-supported decision systems in organizations. Specifically, the study aims to identify how transparency, explainability, perceived accuracy, and technological competence affect managerial confidence in algorithmic recommendations.

The second objective is to investigate the relationship between algorithmic trust and managerial decision quality. Understanding whether trusted algorithms improve strategic, tactical, and operational decisions will contribute significantly to organizational management literature and practical AI implementation.

The final objective is to develop and validate a conceptual framework explaining the antecedents and consequences of algorithmic trust. The proposed framework is expected to provide theoretical guidance for future researchers and practical recommendations for organizations implementing intelligent decision-support technologies.

HYPOTHESIS DEVELOPMENT

Based on existing literature, algorithm transparency, explainability, perceived accuracy, organizational culture, and managerial technological competence are expected to positively influence algorithmic trust. Transparent AI systems provide understandable reasoning, enabling managers to evaluate recommendations more confidently. Similarly, explainable outputs reduce uncertainty and strengthen perceptions of fairness and reliability.

Furthermore, higher levels of algorithmic trust are expected to improve managerial decision quality by encouraging informed reliance on AI-generated recommendations. Therefore, the following hypotheses are proposed:

H₁: Algorithm transparency positively influences algorithmic trust.

H₂: Explainability positively influences algorithmic trust.

H₃: Perceived algorithm accuracy positively influences algorithmic trust.

H₄: Organizational culture positively influences algorithmic trust.

H₅: Managerial technological competence positively influences algorithmic trust.

H₆: Algorithmic trust positively influences managerial decision quality.

CONCEPTUAL FRAMEWORK

The proposed conceptual framework positions algorithmic trust as the mediating construct between technological characteristics and managerial decision quality. Independent variables include algorithm transparency, explainability, perceived accuracy, organizational culture, and managerial technological competence. These factors collectively shape managers' confidence in AI-generated recommendations.

Algorithmic trust functions as the central psychological mechanism influencing whether managers accept, modify, or reject algorithmic advice. Managers who perceive AI systems as transparent, fair, and reliable are more likely to integrate algorithmic insights into strategic and operational decisions.

Finally, managerial decision quality represents the dependent variable. Improved trust is expected to enhance decision speed, accuracy, consistency, and organizational effectiveness while reducing cognitive bias. The framework therefore integrates technological, organizational, and behavioral perspectives into a comprehensive model suitable for empirical testing.

Conceptual Model

Independent Variables → Algorithmic Trust → Managerial Decision Quality

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|--|--|
| <ul style="list-style-type: none"> • Algorithm Transparency • Explainability • Perceived Accuracy | <ul style="list-style-type: none"> • Organizational Culture • Technological Competence |
|--|--|

RESEARCH METHODOLOGY

This study adopts a quantitative research design to examine the determinants of algorithmic trust in managerial decision-making. Primary data will be collected using a structured questionnaire based on validated measurement scales from previous studies. The questionnaire will employ a five-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree."

The target population consists of managers working in organizations that utilize AI-based decision support systems across manufacturing, banking, healthcare, information technology, and service sectors. A sample size of approximately 350–450 managers will be selected using purposive sampling to ensure respondents possess relevant experience with algorithm-supported decision-making.

Data analysis will be performed using SPSS and AMOS/SmartPLS. Reliability will be assessed through Cronbach's Alpha and Composite Reliability, while validity will be examined using Confirmatory Factor Analysis (CFA), Average Variance Extracted (AVE), and discriminant

validity measures. Structural Equation Modeling (SEM) will be used to test the proposed hypotheses and evaluate the conceptual framework.

DATA ANALYSIS

Descriptive statistics will summarize respondents' demographic characteristics and organizational profiles. Reliability analysis will evaluate internal consistency using Cronbach's Alpha values exceeding 0.70. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) will validate the measurement model before hypothesis testing.

Structural Equation Modeling (SEM) will examine direct relationships among variables. Model fit will be evaluated using indices such as CFI, TLI, RMSEA, and Chi-square/df. Mediation analysis will determine whether algorithmic trust mediates the relationship between technological factors and managerial decision quality. Statistical significance will be assessed at the 5% significance level.

RESULTS

The proposed empirical analysis is expected to demonstrate significant positive relationships between algorithm transparency, explainability, perceived accuracy, organizational culture, technological competence, and algorithmic trust. Managers are anticipated to express higher trust levels when AI systems provide understandable explanations and consistently accurate recommendations.

The findings are also expected to reveal that algorithmic trust significantly improves managerial decision quality by increasing confidence, reducing uncertainty, and enhancing decision consistency. Algorithmic trust is likely to function as a partial mediator between technological characteristics and decision outcomes, confirming the proposed conceptual framework.

DISCUSSION

The anticipated findings support previous research emphasizing the importance of transparency and explainability in fostering trust toward intelligent systems. Managers are unlikely to rely solely on algorithmic outputs without understanding the reasoning underlying recommendations. Therefore, explainable AI becomes a critical managerial requirement rather than merely a technical enhancement.

The study further demonstrates that organizational culture significantly influences technology adoption. Organizations promoting innovation, learning, collaboration, and ethical AI governance are expected to develop higher levels of algorithmic trust. Consequently, AI implementation strategies should combine technological investments with organizational change management initiatives.

Finally, the research contributes to management theory by integrating organizational trust theory, technology acceptance theory, and explainable AI into a unified conceptual framework. It also highlights the continuing importance of human judgment in AI-assisted decision-making. Rather than replacing managerial expertise, algorithms function most effectively as decision partners whose recommendations complement human intuition and strategic thinking.

LIMITATIONS

This study adopts a cross-sectional research design, limiting the ability to establish causal relationships over time. Future longitudinal studies may provide deeper insights into how algorithmic trust evolves as managers gain experience with AI systems.

Another limitation concerns the use of self-reported questionnaire data, which may introduce common method bias and respondent subjectivity. Additionally, the findings may not be fully generalizable across industries or countries because organizational AI maturity varies considerably.

FUTURE RESEARCH DIRECTIONS

Future research should investigate longitudinal changes in algorithmic trust as organizations accumulate experience with AI-enabled decision support systems. Researchers may also

explore industry-specific variations across healthcare, banking, education, manufacturing, and public administration.

Further studies should incorporate additional variables such as ethical AI governance, perceived fairness, privacy concerns, cybersecurity, organizational resilience, and cultural differences. Comparative cross-country research would also enhance understanding of algorithmic trust within diverse institutional and regulatory environments.

CONCLUSION

Algorithmic trust has emerged as a crucial determinant of successful managerial decision-making in the era of artificial intelligence. Although AI systems provide unprecedented analytical capabilities, their effectiveness depends largely on managers' confidence in algorithmic recommendations. Transparency, explainability, perceived accuracy, organizational culture, and technological competence collectively influence trust and determine whether algorithmic insights are integrated into organizational decision processes. This study proposes a comprehensive conceptual framework explaining the antecedents and consequences of algorithmic trust. The proposed model contributes to management literature by integrating organizational trust theory with AI adoption and explainable AI perspectives. The research also provides practical guidance for organizations seeking to implement trustworthy, transparent, and human-centered AI systems that enhance managerial decision quality while preserving accountability and ethical governance.

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