

Managerial Attitudes and the Integration of Artificial Intelligence: Impacts on Supply Chain Flexibility

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Artificial intelligence (AI) is rapidly becoming a strategic driver of competitiveness in supply chain management (SCM), enhancing flexibility, efficiency, and responsiveness. However, successful adoption depends not only on technology but also on managerial attitudes and organizational culture. Understanding this behavioral dimension is essential in explaining how leadership influences AI-driven adaptability and resilience. This study develops a conceptual, interdisciplinary framework linking management theory, organizational psychology, and SCM to examine how leadership styles—particularly servant, transactional, and transformational—shape AI integration and adaptability.

The proposed triadic model identifies managerial attitudes, AI-supported decision-making, and information sharing as key behavioral and technological enablers of supply chain flexibility. Findings highlight that innovation-oriented leadership and strong information-sharing cultures accelerate AI adoption and strengthen adaptive capacity, while hierarchical, risk-averse attitudes constrain its impact. The study contributes to a behavioral perspective of SCM, showing that flexibility in AI-enabled supply chains results from the interaction between human and artificial intelligence.

1. Introduction

The growing complexity of global business, rapid technological change, and unpredictable shocks—such as pandemics or geopolitical crises—have imposed new demands on supply chains. Building resilient and adaptive networks has become essential for competitiveness. Supply chain flexibility extends beyond operational responsiveness: decision-making mechanisms, technological readiness, and managerial attitudes jointly shape how organizations respond to disruption, as noted in recent analyses of adaptive supply chain performance (Naz et al., 2022).

Artificial intelligence (AI) has become a key enabler of supply chain performance through predictive analytics and real-time decision support, yet its impact depends as much on behavioral readiness as on technical capability. AI integration reflects both technological and human dimensions, requiring digital infrastructure, leadership openness, and a learning-oriented culture. Although research on AI in supply chains is expanding, much of it focuses on process optimization—a trend highlighted in systematic reviews of AI-driven improvements (Ganesh and Kalpana, 2022) — while the psychological and managerial determinants of adoption remain underexamined.

Leadership styles, risk tolerance, and organizational culture strongly influence the pace and effectiveness of AI integration, a relationship underscored by studies emphasizing the role of leadership and cultural alignment in digital transformation (Kane et al., 2019). These insights underscore that AI is not merely a technological tool but a socio-technical phenomenon embedded in managerial behavior, consistent with analyses framing AI adoption as shaped by intertwined human and technological factors (Dwivedi et al., 2021).

This study develops an interdisciplinary conceptual framework through a qualitative synthesis of management, psychology, and supply chain literature to examine how managerial attitudes drive AI integration and supply chain flexibility.

2. Literature review

In organizational psychology, leaders' psychological characteristics and behavioral models are crucial for understanding how human factors shape organizational outcomes. Managerial behavior decisively influences culture, workplace climate, and overall performance (Somlai, 2019). Leadership is not merely formal authority but a dynamic process reflecting motivation, values, and interpersonal sensitivity (Shamir et al., 2018).

Recent research shows that unintentional communication—such as tone, gestures, or spontaneous emotions—reveals leaders' authentic psychological states (Liu et al., 2023; Willett et al., 2023). Open listening and empathy foster trust and collaboration, while dominance and intolerance signal rigidity (Qtait, 2023).

Empirical studies confirm these links. Willett et al. (2023) found that servant leadership, based on humility and altruism, enhances engagement and well-being, while transactional leadership relying on control limits flexibility. Servant and transformational approaches strengthen autonomy, trust, and psychological safety.

Rabiul et al. (2023), applying self-concept-based leadership theory and the Socially Embedded Flourishing Model (Spreitzer et al., 2005), demonstrated that both servant and transformational leadership promote employee thriving by fostering safety and personal growth. These findings underline that leadership is inherently psychological—it shapes how employees perceive their value and belonging (Shamir et al., 2018).

Effective leaders integrate cognitive, emotional, and relational competencies to build trust and adaptability—key conditions for technological transformation. Dwivedi et al. (2021) highlight that AI adoption depends as much on managerial openness and learning orientation as on infrastructure. Leadership styles encouraging participation and knowledge sharing accelerate digital transformation and collective responsiveness (Kane et al., 2019; Gierlich-Joas et al., 2020).

Overall, managerial attitudes form the behavioral interface between human and technological systems. Empathy, flexibility, and ethical awareness influence how leaders interpret and integrate emerging technologies, shaping AI-driven decision-making, organizational resilience, and supply chain flexibility.

3. The leadership behavior model

In the context of leadership behavior models, numerous studies have examined how leaders' actions and interpersonal dynamics shape organizational adaptability and performance. One such model is proposed by Larsson et al. (2023), who analyzed leadership behavior through the interactional person–situation paradigm. This perspective emphasizes the dynamic and situational nature of leadership, suggesting that behavior does not arise from stable personality traits alone but from the ongoing interaction between individual characteristics and contextual demands. Leadership effectiveness depends on how followers perceive and interpret the leader's actions within specific situations, underscoring that leadership behavior is both a personal and relational construct. This approach provides a valuable framework for understanding how leaders can identify and manage situational challenges more effectively, supporting team performance and adaptability. Morf and Bakker (2024) contributed to this field by exploring the weekly dynamics of transformational leadership and emphasizing the moderating role of prosocial motivation. Their study found that leaders exposed to motivating work characteristics exhibit higher levels of transformational behavior—particularly when they possess strong prosocial motives. Using a random slope model, they demonstrated that leaders' motivation to act in the interest of others amplifies their capacity for inspiration, empowerment, and adaptability. This finding highlights the temporal and motivational fluctuations of leadership behavior, revealing that leadership is not static but varies with emotional and contextual conditions. Prosocial motivation emerges as a crucial regulatory mechanism: leaders who prioritize collective well-being are better equipped to respond flexibly to organizational challenges and to maintain alignment between strategic goals and human needs.

A complementary behavioral perspective is provided by Grill et al. (2023), who applied the ABC model—Antecedents, Behavior, and Consequences—to leadership and workplace safety. Their research approaches leadership from a behavioral psychology standpoint, identifying feedback and active listening as key determinants of effective leadership. The “antecedents” dimension refers to environmental and organizational factors that facilitate or hinder desired behavior, such as communication climate, structural safety practices, and managerial support. “Behavior” denotes the observable actions leaders take to promote safe and ethical work practices, while “consequences” capture feedback and reinforcement processes that sustain positive behavior. The ABC model demonstrates that leadership is not only about direction and control but also about shaping behavioral feedback loops that foster employee responsibility, safety, and organizational trust.

Taken together, these behavioral approaches suggest that leadership is a dynamic, multilevel process that combines personal, situational, and motivational factors. The interactional model (Larsson et al., 2023) explains the situational variability of behavior; the dynamic model (Morf and Bakker, 2024) highlights motivational cycles and emotional regulation; and the ABC framework (Grill et al., 2023) focuses on behavioral feedback and reinforcement. Collectively, they reveal that leadership effectiveness is rooted in adaptive behavioral

mechanisms that allow leaders to balance structure with flexibility. These insights are highly relevant in technologically transforming organizations, where leadership behavior must continuously adapt to data-driven decision environments. Understanding these behavioral patterns provides a foundation for conceptualizing how managerial attitudes shape the integration of artificial intelligence and enhance supply chain flexibility.

3.1 Key conceptual findings

The literature synthesis was developed through thematic coding and cross-comparison of interdisciplinary sources and reveals three key insights into how leadership attitudes influence artificial intelligence (AI) integration and supply chain flexibility. Leadership as a behavioral enabler: Leadership styles based on empathy, communication, and empowerment—such as servant and transformational leadership—consistently foster adaptability and openness to innovation, as demonstrated in leadership communication research (Willett et al., 2023). In contrast, transactional approaches relying on control and reward mechanisms tend to restrict flexibility and slow AI adoption. Behavioral mechanisms of AI integration: Managerial attitudes act as behavioral triggers in AI implementation. Leaders with strong technological awareness and trust in data-driven tools promote collaboration and information sharing, a pattern reflected in studies on technological openness in supply chains (Ganesh and Kalpana, 2022), creating the social infrastructure that enables AI to enhance decision-making precision and responsiveness. Interaction of culture and technology: Organizational culture mediates how leadership attitudes translate into technological performance, as evidenced in research on cultural alignment in digital transformation (Kane et al., 2019). Overall, supply chain flexibility in AI-enabled organizations emerges not as a purely technological achievement but as a socio-behavioral outcome shaped by managerial cognition, cultural norms, and digital infrastructure, consistent with analyses framing AI as a socio-technical system (Dwivedi et al., 2021).

4. The impact of managerial decision-making and information sharing on the supply chain

Managerial decision-making plays a crucial role in maintaining competitiveness in a global, digitally transforming environment. As artificial intelligence (AI) becomes embedded in supply chain operations, decisions evolve from experience-based to data-supported processes. AI systems analyze large datasets, uncover correlations, and generate predictive insights that enhance responsiveness (Ganesh and Kalpana, 2022). However, their effectiveness depends not only on technological sophistication but also on managers' behavioral and cognitive readiness to apply AI-generated knowledge.

In this framework, leadership attitudes represent the initial condition of the model (Figure 1). Openness to technological innovation determines how extensively AI tools are integrated into decision-making. Positive attitudes foster trust in algorithmic insights and encourage experimentation with predictive analytics, while technophobia or resistance constrains adoption. Thus, managerial cognition and behavior function as antecedents shaping AI integration within supply chains.

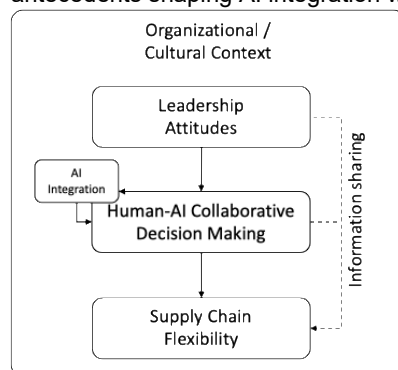


Figure 1: Interaction Between Managerial Decision-Making and AI Integration in Enhancing Supply Chain Flexibility

AI integration enhances data synthesis and real-time coordination across partners, strengthening adaptability. Yet its benefits materialize only when supported by effective information sharing. Transparent communication and cross-functional data exchange mediate the translation of AI insights into operational actions (Dwivedi et al., 2021). Continuous data flow enables predictive refinement and closer alignment between strategic and operational decisions.

Despite its analytical power, AI cannot replace human reasoning. As Hartmann (2021) notes, managerial decisions often involve ethical reflection, contextual judgment, and intuition—dimensions that algorithms cannot

replicate. Hence, AI should be viewed as a complementary partner augmenting human decision-making (Klump and Zijm, 2019).

The optimal configuration lies in human–AI collaboration: algorithms provide analytical precision, while humans contribute contextual awareness and ethical oversight. This synergy requires technical infrastructure and a supportive culture that values learning and shared responsibility. Training and trust are essential for employees to interpret and use AI insights effectively.

As illustrated in Figure 1, open managerial attitudes trigger AI adoption, enhance information sharing, and ultimately increase supply chain flexibility. This creates adaptive capacity—allowing rapid and coherent responses to uncertainty. By positioning managerial attitudes and information sharing as behavioral levers, the model bridges leadership psychology and data-driven supply chain management, emphasizing the need for integrative leadership in AI-enabled organizations (Naz et al., 2022).

5. Leadership attitudes and the role of artificial intelligence

The application of artificial intelligence (AI) depends largely on the attitude and decision-making style of leaders. Managerial attitudes act as behavioral levers that shape both technological adoption and human–AI collaboration. Innovative leaders proactively explore AI’s potential, initiating pilot projects to test its value and competitive benefits (Dwivedi et al., 2021), whereas risk-averse managers adopt a wait-and-see approach, implementing AI only after proven success elsewhere (Agrawal et al., 2024).

Based on these behavioral patterns, three managerial attitudes toward AI can be distinguished (Figure 2): AI Champions—high openness, experimentation, and trust in data-driven tools; Cautious Adopters—moderate openness with strong governance and risk control; and Skeptical Observers—low openness and reliance on established routines. Each attitude implies different integration paths, information-sharing needs, and impacts on flexibility.

For successful implementation, AI systems must align with organizational culture. Culture defines communication norms and shared values, serving as a contextual enabler: learning-oriented and psychologically safe environments reduce perceived risks and support human–AI collaboration (Kane et al., 2019). Centralized, hierarchical structures often resist data-driven decision-making, while decentralized firms adopt AI more readily due to greater local autonomy. Asset-intensive sectors such as automotive supply chains benefit from decision-support “co-pilot” tools that enhance responsiveness while maintaining managerial oversight (Naz et al., 2022).

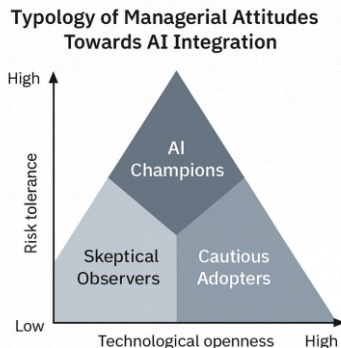


Figure 2: Triadic Interaction of Managerial Attitudes, Organizational Culture, and Technological Infrastructure in AI Integration

This diagram illustrates the dynamic interplay among managerial attitudes, organizational culture, and technological infrastructure in shaping the success of AI integration within supply chains. Managerial attitudes function as the behavioral driver, organizational culture as the contextual enabler, and technological infrastructure as the operational foundation, encompassing digital maturity, data architecture, and system interoperability. Together, these interdependent dimensions determine how organizations perceive, accept, and apply AI technologies. The triad also interfaces with the Section 4 process model: managerial attitudes trigger AI integration and human–AI collaborative decision-making, while information sharing mediates their translation into supply chain flexibility. Together, these interdependent dimensions determine how organizations perceive, accept, and apply AI technologies.

The automotive industry offers a particularly relevant example of this triadic interaction. Multi-tier supplier networks, strict quality standards, and just-in-time coordination require both precision and adaptability, making AI integration highly valuable for predictive maintenance, demand forecasting, and logistics optimization. However, the hierarchical and compliance-oriented nature of the sector also shapes managerial behavior:

decision-making often follows procedural control, while innovation depends on cross-functional collaboration. Transformational and servant leaders foster innovation by empowering teams to experiment with AI-driven analytics and production planning, whereas transactional leaders emphasize stability and efficiency. Large OEMs increasingly rely on “co-pilot” decision-support systems that augment managerial judgment, while Tier-1 suppliers experiment with autonomous scheduling and forecasting. These sectoral patterns illustrate how managerial openness and cultural support jointly determine the speed and depth of AI integration, influencing overall supply chain adaptability and competitiveness.

Table 1: SWOT comparison of leadership styles in adopting AI technologies in supply chain management

<i>Leadership style</i>	<i>Strengths</i>	<i>Weaknesses</i>	<i>Opportunities</i>	<i>Threats</i>
<i>Servant leadership (SL)</i>	<i>Empathy, trust, and open communication foster psychological safety and collaboration; enhances employee engagement and ethical AI use</i>	<i>Decision processes may be slower; risk of excessive consensus-seeking</i>	<i>Builds strong human–AI collaboration; improves knowledge sharing and long-term adoption success</i>	<i>Possible resistance to automation if perceived as replacing human roles</i>
<i>Transformational leadership (TL)</i>	<i>Inspires innovation and experimentation; motivates teams toward digital transformation; aligns AI with vision and strategy</i>	<i>May overestimate or underestimate implementation complexity</i>	<i>Accelerates cultural change and digital maturity; strengthens adaptive capacity</i>	<i>Potential burnout or unrealistic expectations among followers</i>
<i>Transactional leadership (TR)</i>	<i>Provides structure, clear rules, and accountability; suitable for monitoring AI performance in standardized contexts</i>	<i>Limited creativity, weak flexibility, low tolerance for uncertainty</i>	<i>Enables short-term efficiency through rule-based AI use</i>	<i>Can stifle innovation, inhibit learning, and delay AI adoption</i>
<i>AI Champions</i>	<i>High openness and risk tolerance; proactive pilot projects and data-driven experimentation</i>	<i>Resource-intensive approach; prone to over-reliance on technology</i>	<i>Early-mover advantage; benchmark creation for peers</i>	<i>High implementation cost and ethical/algorithmic bias risks</i>
<i>Cautious Adopters</i>	<i>Balanced innovation with control; strong governance focus</i>	<i>Slow decision cycles; fragmented data culture</i>	<i>Sustainable adoption with risk mitigation</i>	<i>Losing competitive speed compared to early adopters</i>
<i>Skeptical Observers</i>	<i>Maintain stability and procedural compliance</i>	<i>Resistance to change; lack of learning culture</i>	<i>Gradual adoption after proven success; limited pilot testing</i>	<i>Strategic obsolescence; declining flexibility and competitiveness</i>

6. Conclusions

This study explored how managerial attitudes and artificial intelligence (AI) jointly influence supply chain flexibility and resilience. The proposed framework links leadership behavior, AI integration, and information sharing as behavioral and technological enablers of adaptability, showing that AI adoption is as much a human and cultural process as a technological one.

Managerial openness, digital competence, and leadership style determine how effectively AI is implemented. Transformational and servant leadership foster trust and experimentation, while control-oriented styles limit adaptability. Information sharing mediates these effects, translating behavior into coordinated, data-driven responses as also shown in case-based findings reported in the literature.

The triad of managerial attitudes, organizational culture, and technological infrastructure underscores that sustainable AI integration depends on their alignment. Technical investments without behavioral readiness or cultural support remain underused, while leadership without digital maturity cannot scale.

Although conceptual in nature, this framework offers a foundation for empirical testing through structural equation modelling (SEM), interviews, or case studies—particularly in automotive supply chains—to quantify behavioral and technological linkages and validate the model.

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