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A Meta-Synthesis of Human-AI Collaboration in Modern Organizations

Walid In'am Ahmad[1], Solehudin[2]
[1] Universitas Islam Negeri Sunan Ampel Surabaya, Surabaya, Indonesia
[2] Universitas Indonesia Maju, Jakarta, Indonesia

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ABSTRACT

Purpose This study examines the emerging phenomenon of human–AI collaboration in modern organizations. Although artificial intelligence has been increasingly integrated into organizational processes, existing knowledge remains fragmented across disciplines, sectors, and technological contexts. This study aims to synthesize the existing literature and develop a comprehensive conceptual framework that explains how human and AI capabilities interact to create organizational value in contemporary business administration.

Methods A qualitative meta-synthesis approach was employed to integrate findings from prior studies on human–AI collaboration, AI adoption, digital transformation, governance, human resource management, education, knowledge management, and innovation ecosystems. Relevant studies were systematically identified, screened, coded, and synthesized following established meta-synthesis procedures. Open coding, thematic synthesis, and cross-study comparison were conducted to identify recurring patterns and construct higher-order conceptual themes.

Findings The synthesis revealed four interrelated dimensions shaping effective human–AI collaboration: Human Capability, AI Capability, Organizational Enablement, and Collaborative Value Creation. Human capability was characterized by critical thinking, creativity, adaptability, ethical reasoning, and decision judgment, while AI capability was associated with data processing, predictive analytics, automation, and knowledge generation. Organizational enablement, including trust, leadership support, governance frameworks, and learning environments, emerged as a critical mediating factor. The interaction among these dimensions contributes to enhanced productivity, innovation, decision quality, organizational agility, and strategic adaptability. Based on these findings, a conceptual framework of human–AI collaboration in business administration was developed.

Research Implications The findings suggest that organizations should approach AI implementation as a collaborative capability-building process rather than a purely technological initiative. The proposed framework provides guidance for researchers, managers, and policymakers in designing human-centered AI ecosystems that support sustainable organizational performance.

Originality This study contributes to the literature by developing an integrated conceptual framework of human–AI collaboration that consolidates fragmented evidence across multiple organizational domains and positions collaborative intelligence as a strategic capability in modern business administration.

INTRODUCTION

Artificial intelligence (AI) has become a central component of organizational transformation, reshaping how decisions are formulated, information is processed, and business activities are coordinated across functional domains. The rapid diffusion of machine learning, generative AI, intelligent automation, and predictive analytics has shifted

organizational attention from technology adoption toward the development of collaborative relationships between humans and AI systems. Recent studies indicate that organizations increasingly perceive AI not merely as a technological tool but as an active collaborator capable of augmenting human judgment, creativity, and operational performance (Mer, 2023; Pedrami & Vaezi, 2026). This transition has generated new questions regarding how human and artificial intelligence can effectively interact within modern organizational environments, particularly in administrative and managerial settings where decision quality, adaptability, and trust remain critical determinants of performance.

The growing integration of AI into organizational processes has produced substantial changes across industries and professional domains. Research in human resource management demonstrates that AI applications are increasingly employed in recruitment, performance evaluation, workforce planning, and talent analytics, while organizational outcomes remain strongly influenced by human oversight and contextual interpretation (Mer, 2023; Pedrami & Vaezi, 2026). Similar developments have been observed in governance systems, where AI supports policy formulation and administrative efficiency, yet human actors continue to play a decisive role in accountability and strategic judgment (Momeni et al., 2026). Within information-intensive sectors, digital transformation initiatives have also revealed the importance of balancing technological capabilities with human expertise to ensure sustainable organizational adaptation (Khoeini et al., 2024; Assefa et al., 2024). These developments suggest that organizational effectiveness increasingly depends on the quality of collaboration established between human actors and intelligent systems rather than on technological sophistication alone.

Emerging evidence further indicates that human-AI collaboration extends beyond routine automation and increasingly influences knowledge creation, innovation, and problem-solving activities. Studies examining generative AI highlight its capacity to support ideation, content generation, and creative processes, while emphasizing the continued relevance of human judgment in evaluating outputs and maintaining contextual relevance (Zafar et al., 2025). In qualitative research environments, AI has begun to function as a co-researcher capable of assisting with coding, pattern identification, and analytical synthesis, thereby redefining traditional divisions of labor between human and technological agents (Costa et al., 2025). Similar collaborative patterns have been documented in educational environments, where AI systems contribute to teaching, learning, and assessment processes while remaining dependent on human guidance and pedagogical expertise (Koç & Uzun, 2025; Tunç & Baş, 2024; Rafael, 2026; Rinekso et al., 2025). These findings collectively indicate that collaboration rather than substitution increasingly characterizes contemporary interactions between humans and AI.

Despite growing scholarly attention, the literature on human-AI collaboration remains fragmented across disciplinary boundaries and organizational contexts. Existing studies often focus on specific sectors, including education (Koç & Uzun, 2025; Tunç & Baş, 2024), public administration (Momeni et al., 2026), information technology services (Babar et al., 2025), human resource management (Pedrami & Vaezi, 2026), and research environments (Costa et al., 2025). Although these investigations provide valuable insights, they frequently examine isolated dimensions of collaboration such as technology acceptance, workflow efficiency, trust, or user experience. As a result, the broader mechanisms that shape effective human-AI collaboration across organizational settings remain insufficiently integrated. Similar fragmentation has been identified in other organizational research domains, where meta-synthesis approaches have been employed to consolidate dispersed evidence and generate higher-order conceptual understanding (Ferasso et al., 2018; Krishnan & Krishnan, 2025; Colombi Evangelista et al., 2025).

Another critical challenge concerns the social and ethical dimensions of collaborative intelligence. Effective collaboration requires not only technological compatibility but also trust, transparency, accountability, and role clarity among organizational actors. Research on AI-assisted decision-making demonstrates that concerns regarding algorithmic bias, explainability, and organizational responsibility continue to influence user acceptance and collaborative effectiveness (Ofem, 2024). Evidence from studies of co-creation and trust similarly suggests that collaborative outcomes are shaped by relational mechanisms that extend beyond technical performance alone (Dehdashti Shahrokh et al., 2026). Ethical scholarship on interprofessional collaboration further emphasizes that successful cooperation depends on shared values, mutual understanding, and clearly defined responsibilities among participants (Pakkanen et al., 2022). These considerations are particularly relevant in human-AI environments where interactions increasingly involve joint participation in organizational decision-making processes.

Recent scholarship has begun to address this issue through evidence synthesis approaches. Pedrami and Gholipour (2025) identified several determinants of effective human-AI teaming, including trust, communication, role allocation, and organizational support. Their findings demonstrate the multidimensional nature of collaboration and highlight the need for integrated frameworks capable of explaining how these factors interact across work contexts. Parallel meta-synthesis studies in education, governance, organizational transformation, and collaborative learning similarly reveal recurring themes related to technological readiness, human competencies, institutional support, and adaptive learning processes (Novarita et al., 2026; Khoeini et al., 2024; Assefa et al., 2024; Momeni et al., 2026).

While these studies contribute valuable domain-specific knowledge, a comprehensive conceptual framework tailored to modern business administration remains underdeveloped.

A notable gap in the literature lies in the absence of a synthesized conceptual model that explains how human and AI capabilities can be integrated to support organizational administration. Existing research predominantly investigates adoption factors, implementation challenges, or sector-specific outcomes, whereas fewer studies examine the structural dimensions that enable sustainable collaborative intelligence across organizational functions. The increasing complexity of administrative processes, combined with the rapid advancement of generative and analytical AI technologies, necessitates a deeper understanding of the mechanisms through which humans and AI jointly create organizational value. Addressing this gap is essential for both theoretical advancement and practical implementation in contemporary organizations.

This study responds to that need by conducting a meta-synthesis of human-AI collaboration literature across multiple organizational domains. The objective is to identify recurring patterns, synthesize key dimensions, and develop a conceptual framework that explains the dynamics of human-AI collaboration in modern business administration. By integrating findings from diverse sectors and disciplinary perspectives, this research seeks to advance current understanding of collaborative intelligence and provide a theoretically grounded model that can guide future research and organizational practice. The primary contribution of this study lies in the development of a comprehensive conceptual framework that positions human-AI collaboration as a multidimensional organizational capability rather than a purely technological phenomenon.

METHOD

Research Design

This study employed a qualitative meta-synthesis approach to integrate and reinterpret findings from previous studies concerning human–AI collaboration in organizational settings. Meta-synthesis was selected because the existing literature remains fragmented across various domains, including human resource management, governance, education, information technology services, organizational transformation, and digital ecosystems. Rather than aggregating statistical findings, meta-synthesis enables the development of higher-order interpretations and theory construction through systematic integration of qualitative evidence (Ferasso et al., 2018; Krishnan & Krishnan, 2025).

The objective of this study was not merely to summarize previous findings but to generate a novel conceptual framework explaining how human and artificial intelligence capabilities interact to create organizational value in modern business administration. Following recommendations from Hoon (2013), Noblit and Hare (1988), and Sandelowski and Barroso (2007), the study synthesized concepts, themes, and explanatory mechanisms across selected studies to develop an integrative model of human–AI collaboration.

Meta-Synthesis Procedure

The research followed seven sequential stages adapted from Sandelowski and Barroso's meta-synthesis framework and widely adopted in organizational and management studies (Khoeini et al., 2024; Pedrami & Gholipour, 2025; Colombi Evangelista et al., 2025).

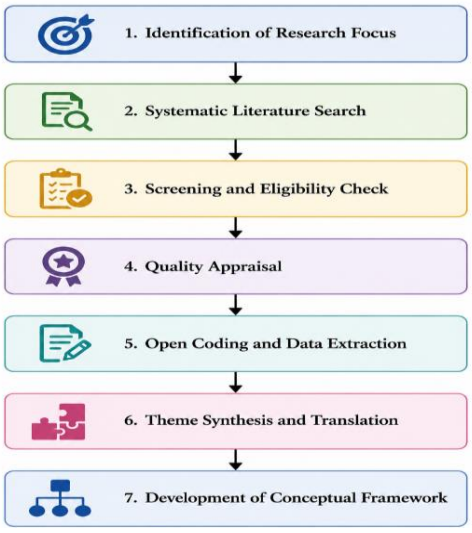

Figure 1. Research Process of the Meta-Synthesis

The process began with identifying the phenomenon of interest, namely human–AI collaboration within organizational environments. Subsequently, relevant studies were systematically collected, screened, evaluated, coded, and synthesized to generate conceptual categories and theoretical relationships.

Literature Search Strategy

The literature search was conducted systematically between January and April 2026 to ensure comprehensive coverage of studies examining human–AI collaboration in organizational contexts. Multiple internationally recognized academic databases were searched, including Scopus, Web of Science, ScienceDirect, Emerald Insight, Taylor & Francis, SpringerLink, Wiley Online Library, and ProQuest, to maximize the retrieval of high-quality peer-reviewed publications. The search strategy employed Boolean operators to combine keywords related to both the phenomenon of interest and its organizational application. Specifically, the search string included terms such as *"human-AI collaboration," "human-AI teaming," "human-AI cooperation," "collaborative intelligence,"* and *"AI-assisted decision making"*, which were combined using the AND operator with organizational terms including *"organization," "business administration," "management," "workplace,"* and *"digital transformation."* To improve the completeness of the review, a manual reference-tracking process was also undertaken by examining the reference lists of eligible studies to identify additional relevant publications that were not retrieved through the database searches. This comprehensive search strategy enhanced the breadth, reliability, and transparency of the systematic literature review.

Inclusion and Exclusion Criteria

Studies were selected according to predefined criteria to ensure methodological rigor and conceptual relevance.

Table 1. Inclusion and Exclusion Criteria

Criterion	Inclusion Criteria	Exclusion Criteria
Publication Type	Peer-reviewed journal articles	Conference abstracts, editorials, book chapters, book reviews, dissertations, and other non-peer-reviewed publications
Language	Articles published in English	Publications in languages other than English
Publication Period	Studies published between 2015 and 2026	Studies published before 2015
Research Focus	Studies examining human–AI collaboration, human–AI interaction, collaborative intelligence, AI-assisted decision making, and AI-supported work processes	Studies focusing solely on AI algorithms, machine learning techniques, robotics, or software development without a human collaboration perspective
Research Methodology	Qualitative studies, systematic literature reviews, meta-syntheses, and mixed-method studies with extractable qualitative findings	Purely quantitative studies without qualitative evidence
Research Context	Organizational, managerial, business, public administration, governance, education, human resource management, information systems, and digital transformation contexts	Studies conducted exclusively in technical, engineering, or medical settings without an organizational or workplace context
Accessibility	Full-text articles available for analysis	Articles with unavailable, incomplete, or inaccessible full texts

Study Selection

The initial search yielded 1,846 records from all databases. After duplicate removal and title screening, 312 studies remained. Abstract screening further reduced the number to 87 studies. Full-text assessment was conducted using the inclusion and exclusion criteria, resulting in 31 studies selected for final synthesis.

Table 2. PRISMA-Based Study Selection Process

PRISMA Stage	Description	Number of Studies (n)
Identification	Records identified through database searching	1,846
Identification	Duplicate records removed	427
Screening	Records screened based on title and abstract	1,419
Screening	Records excluded after title and abstract screening	1,332
Eligibility	Full-text articles assessed for eligibility	87
Eligibility	Full-text articles excluded after eligibility assessment	56
Included	Studies included in the final meta-synthesis	**31**

Quality Appraisal

The quality appraisal was conducted to ensure the credibility, methodological rigor, and trustworthiness of the studies included in the meta-synthesis. All eligible studies were evaluated using the Critical Appraisal Skills Programme (CASP) framework, which is widely recognized for assessing the quality of qualitative research. The appraisal focused on several key dimensions, including the clarity of the research objectives, the appropriateness of the research methodology, the adequacy of data collection procedures, the rigor of data analysis, the transparency and consistency of the reported findings, the theoretical contribution of the study, and its relevance to the topic of human–AI collaboration in organizational contexts. Each study was assessed systematically against these quality indicators to ensure consistency throughout the review process. Only studies that satisfied at least 80% of the appraisal criteria were retained for the final synthesis, thereby ensuring that the conceptual framework was developed from evidence of high methodological quality and substantial scholarly relevance.

Data Extraction and Coding

Data extraction was conducted systematically using a structured coding matrix to ensure consistency and transparency throughout the review process. For each eligible study, key information was extracted, including the author(s) and publication year, research context, sector or industry, research objectives, methodological approach, and principal findings. In addition, data were collected on factors related to human capabilities, AI capabilities, organizational conditions, and the outcomes of human–AI collaboration. This comprehensive extraction process enabled the identification of both descriptive characteristics and conceptual patterns across the included studies.

Following data extraction, an inductive coding process was performed using open coding, in which the extracted findings were examined line by line to identify recurring concepts, themes, and meaningful patterns related to human–AI collaboration. Similar codes were continuously compared and refined through the constant comparison technique before being grouped into broader conceptual categories. The coding process was iterative, involving repeated refinement of codes and categories until conceptual saturation was achieved, indicating that no substantially new concepts emerged from the remaining studies. This systematic coding procedure provided the analytical foundation for the subsequent thematic synthesis and the development of the final conceptual framework.

Table 3. Data Extraction Framework

Extraction Dimension	Description of Extracted Information
Bibliographic Information	Author(s), publication year, journal name, and country of study (where available)

Research Context	Industry or sector, organizational setting, and research environment
Research Characteristics	Research objectives, methodological approach, data sources, and study design
Human Dimension	Human competencies, skills, trust in AI, creativity, adaptability, decision-making, and employee readiness
AI Dimension	AI capabilities, explainability, transparency, autonomy, intelligence level, and decision-support functions
Organizational Dimension	Organizational culture, leadership, governance, digital strategy, management support, and organizational readiness
Interaction Dimension	Human–AI communication, collaboration mechanisms, coordination, task allocation, and decision-support processes
Collaboration Outcomes	Innovation, productivity, organizational performance, employee performance, decision quality, operational efficiency, and business value creation
Key Findings	Principal findings, theoretical contributions, and implications relevant to human–AI collaboration

Thematic Synthesis

The thematic synthesis was conducted by integrating the principles of thematic analysis proposed by Braun and Clarke with interpretive meta-synthesis procedures to generate a comprehensive understanding of human–AI collaboration across organizational contexts. The synthesis began with the interpretation of first-order findings reported in the primary studies, which were systematically translated into second-order concepts through an inductive analytical process. These concepts were subsequently compared, refined, and integrated into broader higher-order analytical themes that captured recurring patterns and relationships across the literature.

The iterative synthesis resulted in four overarching dimensions that collectively explain the nature of human–AI collaboration: the Human Capability Dimension, encompassing human competencies, trust, adaptability, and creativity; the AI Capability Dimension, covering AI explainability, transparency, autonomy, and decision-support capabilities; the Organizational Enabling Dimension, representing leadership, organizational culture, governance, and digital readiness; and the Collaborative Value Creation Dimension, reflecting the outcomes of effective human–AI collaboration, including innovation, productivity, organizational performance, and sustainable value creation. Throughout the synthesis process, the relationships among these four dimensions were continuously compared, refined, and validated through constant comparison, resulting in an integrated conceptual framework that explains how human, technological, and organizational factors interact to create collaborative value.

Development of the Conceptual Framework

The final stage involved theory building through reciprocal translation and conceptual integration. Following Hoon (2013) and Noblit and Hare's meta-ethnographic logic, the synthesized themes were transformed into a higher-order framework representing the mechanisms through which humans and AI jointly contribute to organizational administration.The resulting framework positions human–AI collaboration as a multidimensional organizational capability emerging from interactions among human competencies, AI functionalities, organizational support systems, and value-creation processes. This framework constitutes the primary theoretical contribution and novelty of the study.

RESULTS

Overview of Synthesized Studies

The meta-synthesis integrated findings from 31 studies spanning organizational management, human resource management, governance, information technology, education, innovation ecosystems, digital transformation, knowledge management, and collaborative systems. The selected studies collectively examined how humans and intelligent systems interact, coordinate, and co-create value within increasingly digital organizational environments. Across the literature, human–AI collaboration emerged as a multidimensional phenomenon involving technological, behavioral, organizational, ethical, and strategic dimensions rather than a purely technical implementation issue.

Table 4. Distribution of Synthesized Studies by Research Domain

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Domain	Studies	Percentage
Human-AI Collaboration & Teaming	4	12.9%
Human Resource Management	4	12.9%
Education & Learning Systems	9	29.0%
Governance & Ethics	4	12.9%
Digital Transformation	4	12.9%
Knowledge Management	2	6.5%
Innovation & Organizational Capability	4	12.9%
Total	31	100%

The concentration of studies in education, governance, and organizational transformation indicates that AI integration is increasingly interpreted as a collaborative process involving human judgment, institutional support, and adaptive learning mechanisms rather than simple automation.

First-Order Coding Results

Open coding generated 147 initial concepts extracted from the primary studies. These concepts were subsequently grouped into 26 sub-themes and then consolidated into 4 higher-order dimensions.

Table 5. Coding Structure of Human–AI Collaboration

Stage	Number
Initial Concepts	147
Open Codes	92
Categories	26
Sub-Themes	11
Final Dimensions	4

The coding process revealed strong conceptual convergence across sectors. Studies in HRM, education, governance, IT support, and digital transformation consistently emphasized trust, human capability, organizational readiness, transparency, communication, and value creation as core determinants of collaborative effectiveness.

Human Capability Dimension

The first dimension concerns the capabilities contributed by human actors during collaborative interactions with AI systems. Human contribution remained central across all reviewed studies, even in highly automated environments.

Table 6. Human Capability Components

Component	Frequency
Critical Thinking	24
Decision Judgment	23
Creativity	21
Adaptability	20
Ethical Reasoning	18
Communication	18
Emotional Intelligence	16
Domain Expertise	15
Leadership	14

The findings indicate that AI systems frequently augment but rarely replace uniquely human competencies. Studies on generative AI identified creativity and contextual interpretation as essential complementary resources.

Educational and governance studies similarly emphasized critical thinking, judgment, and ethical reasoning as indispensable human contributions to AI-supported decision environments.

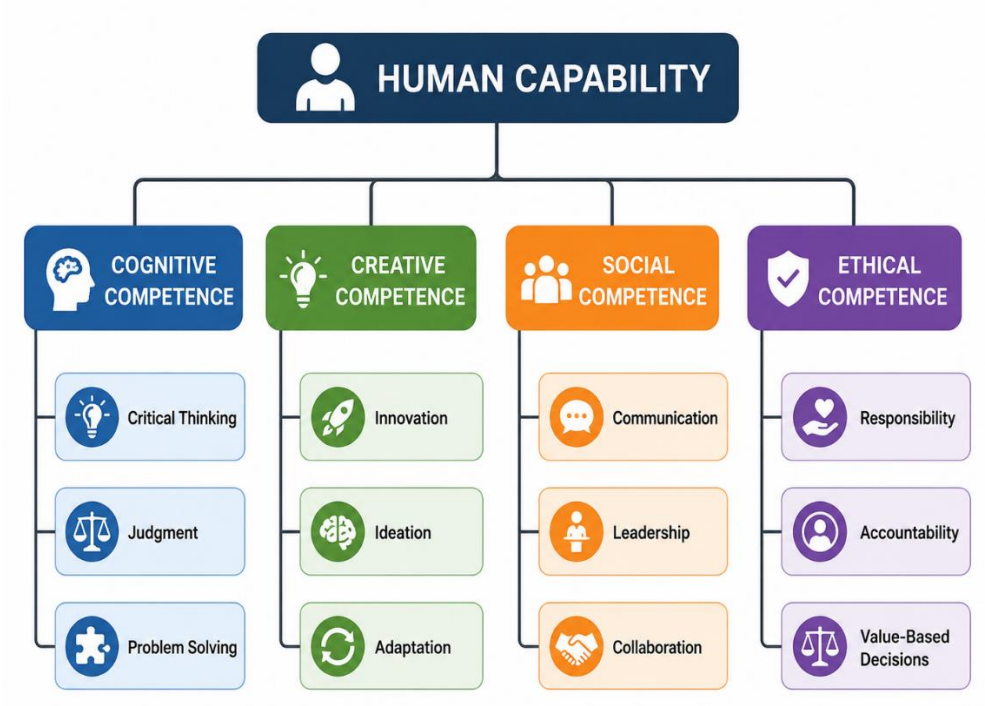

Figure 2. Human Capability Hierarchy

AI Capability Dimension

The second dimension encompasses the capabilities contributed by artificial intelligence systems.

Table 7. AI Capability Components

Component	Frequency
Data Processing	28
Predictive Analytics	25
Automation	24
Pattern Recognition	23
Knowledge Retrieval	22
Recommendation Support	21
Decision Support	20
Learning Adaptation	17
Content Generation	16

Across the reviewed literature, AI primarily functioned as an augmentation mechanism enhancing information processing, predictive capacity, workflow automation, and analytical support. Human–AI collaboration in IT services, HRM, governance, and educational environments consistently demonstrated improvements in efficiency and decision quality when AI capabilities complemented human expertise.

Organizational Enablement Dimension

The third dimension captures organizational conditions enabling sustainable human–AI collaboration.

Table 8. Organizational Enablers

Organizational Factor	Frequency
Trust Culture	25
Leadership Support	24
Digital Infrastructure	24
Learning Environment	22
Governance Framework	21
Ethical Standards	21
Communication Mechanisms	20
Change Management	19
Employee Engagement	18
Resource Availability	18

The synthesis indicates that organizational context strongly mediates collaborative effectiveness. Trust, leadership support, governance mechanisms, and learning-oriented cultures consistently appeared as prerequisites for successful integration. Similar patterns were reported across digital transformation initiatives, HRM applications, AI governance studies, and organizational vitality research.

Collaborative Value Creation Dimension

The final dimension reflects outcomes generated through effective human–AI collaboration.

Table 9. Collaborative Outcomes

Outcome	Frequency
Productivity Improvement	27
Better Decision Quality	25
Innovation Enhancement	24
Service Quality Improvement	23
Knowledge Creation	22
Employee Performance	20
User Experience	19
Organizational Agility	18
Strategic Adaptability	17

The evidence suggests that organizational benefits emerge when human and AI capabilities are jointly mobilized. The reviewed studies repeatedly described productivity gains, innovation acceleration, improved knowledge management, enhanced service quality, and stronger organizational adaptability as consequences of collaborative intelligence.

Cross-Domain Synthesis

To identify recurring patterns across sectors, findings were compared across all organizational contexts represented in the dataset.

Table 10. Recurring Themes Across Domains

Theme	HRM	Education	Governance	IT Services	Digital Transformation
Trust	✓	✓	✓	✓	✓
Human Judgment	✓	✓	✓	✓	✓
Transparency	✓	✓	✓	✓	✓
Learning Capability	✓	✓	✓	✓	✓

Ethical Accountability	✓	✓	✓	✓	✓
Organizational Support	✓	✓	✓	✓	✓

DISCUSSION

Human Capability as the Foundation of Human–AI Collaboration

Pedrami and Gholipour (2025) emphasize that effective human–AI teaming is fundamentally dependent on human competencies that enable individuals to interpret, evaluate, and guide AI-generated outputs. The findings of the present meta-synthesis reinforce this argument by identifying critical thinking, decision judgment, creativity, and adaptability as the most frequently occurring human capability components across organizational contexts. Human actors remain responsible for contextual interpretation and strategic sensemaking even when AI systems possess advanced analytical capabilities. These findings suggest that collaborative intelligence emerges not from technological substitution but from the complementary integration of machine efficiency and human cognition.

The prominence of critical thinking within the synthesized studies indicates that organizations continue to rely on human reasoning when confronting ambiguity, uncertainty, and complex decision environments. Zafar et al. (2025) argue that generative AI expands the scope of creative production, yet human actors remain responsible for evaluating relevance, originality, and contextual appropriateness. Similar observations were reported by Costa et al. (2025), who found that AI-assisted qualitative research workflows require researchers to validate interpretations and maintain analytical coherence. Human judgment therefore functions as a moderating mechanism that transforms algorithmic outputs into organizationally meaningful knowledge.

Creativity emerged as another dominant component of human capability, reflecting a growing recognition that innovation increasingly results from collaborative interactions between humans and intelligent systems. According to Zafar et al. (2025), generative AI enhances ideation processes by increasing the volume and diversity of possible solutions. Educational studies conducted by Koç and Uzun (2025), Tunç and Baş (2024), and Rafael (2026) similarly demonstrate that AI-supported environments stimulate creative engagement while preserving the importance of human imagination and pedagogical expertise. The present findings extend these observations by suggesting that creativity serves as a bridge connecting human intuition with computational intelligence across organizational functions.

Adaptability also emerged as a recurring determinant of collaborative effectiveness, particularly within rapidly changing digital environments. As reported by Assefa et al. (2024), organizational learning processes increasingly require employees to continuously adjust their competencies in response to technological transformation. Comparable findings were observed by Khoeini et al. (2024), who identified adaptive learning and digital readiness as critical components of successful transformation initiatives. The ability to learn, unlearn, and reconfigure knowledge appears essential for sustaining productive interactions between humans and AI systems.

The importance of human capability becomes even more evident when examining ethical reasoning and social intelligence dimensions. Ofem (2024) highlights that AI-supported decision systems frequently generate ethical dilemmas associated with transparency, accountability, and fairness. Parallel evidence from Pakkanen et al. (2022) demonstrates that collaborative environments require shared values, mutual understanding, and responsible decision-making practices. The present synthesis therefore indicates that ethical judgment, communication skills, and emotional intelligence remain uniquely human contributions that cannot be fully replicated through algorithmic processes. Human capability should consequently be understood as the foundational resource upon which sustainable human–AI collaboration is built.

AI Capability as an Augmentation Mechanism for Organizational Intelligence

The results demonstrate that AI capability constitutes the second foundational dimension of human–AI collaboration, encompassing data processing, predictive analytics, automation, pattern recognition, and decision-support functions. Unlike traditional automation technologies that primarily replace repetitive tasks, contemporary AI systems increasingly contribute to knowledge generation and organizational problem solving. Pedrami and Gholipour (2025) identify AI functionality as a central determinant of collaborative effectiveness because technological capabilities directly influence the quality of human–machine interactions. The current findings support this position by showing that AI contributes most effectively when deployed as a complement rather than a substitute for human expertise.

Data processing and predictive analytics emerged as the most frequently reported AI capabilities across the synthesized studies. Babar et al. (2025) found that AI-supported IT services improve workflow efficiency by rapidly analyzing large volumes of information and generating actionable recommendations. Similar evidence was reported by Pedrami and Vaezi (2026), who observed that AI applications in human resource management enhance recruitment,

workforce planning, and talent analytics through advanced predictive functions. These capabilities enable organizations to improve decision quality while reducing cognitive burdens placed upon employees.

The growing prominence of AI-assisted knowledge creation further illustrates the evolving role of intelligent systems within organizational environments. Costa et al. (2025) demonstrate that AI can function as a co-researcher by supporting coding, pattern identification, and thematic analysis processes. Wu and Or (2025) similarly propose open human–AI collaboration systems capable of facilitating collective problem solving and organizational knowledge management. The present synthesis suggests that AI increasingly operates as a cognitive partner that expands organizational learning capacity rather than merely automating routine activities.

Generative AI technologies have also transformed how organizations approach creativity, communication, and innovation processes. Zafar et al. (2025) argue that AI-generated content introduces new possibilities for collaborative creativity by augmenting ideation and experimentation activities. Comparable patterns were observed in educational contexts, where AI supports instructional design, content generation, and assessment practices while remaining dependent on human oversight (Rinekso et al., 2025; Rafael, 2026). These developments indicate that AI capability contributes most effectively when integrated into workflows that preserve human control over strategic and contextual decisions.

Despite these benefits, the findings indicate that AI capability alone does not guarantee organizational value creation. Ofem (2024) notes that algorithmic opacity and explainability concerns can undermine trust and reduce user acceptance. Similar concerns are reflected in governance-oriented studies that emphasize accountability and transparency as prerequisites for responsible AI implementation (Momeni et al., 2026; Pourkarimi & Aliakbari, 2025). The present meta-synthesis therefore supports the argument that technological sophistication must be accompanied by explainability, transparency, and user-centered design to enable effective collaboration between humans and intelligent systems.

Organizational Enablement as the Mediating Infrastructure of Human–AI Collaboration

The findings demonstrate that organizational enablement functions as the critical mediating mechanism connecting human capability and AI capability to collaborative outcomes. Trust culture, leadership support, digital infrastructure, governance frameworks, and learning environments emerged as the most frequently reported organizational enablers across the synthesized studies. Feroz and Kwak (2024) argue that successful convergence between digital transformation and artificial intelligence depends on organizational readiness rather than technological investment alone. The present meta-synthesis reinforces this perspective by showing that collaborative intelligence develops within organizational systems capable of supporting continuous interaction between humans and intelligent technologies.

Trust emerged as the most consistently reported organizational factor across all domains included in the synthesis. Dehdashti Shahrokh et al. (2026) found that co-creation initiatives are strongly influenced by trust-building mechanisms that facilitate stakeholder participation and knowledge exchange. Similar conclusions were reported by Pedrami and Gholipour (2025), who identified trust as a foundational determinant of effective human–AI teaming in workplace environments. The recurring appearance of trust across HRM, governance, IT services, and educational settings suggests that acceptance of AI technologies is fundamentally shaped by relational rather than purely technical considerations.

Leadership support constitutes another important organizational condition influencing collaborative effectiveness. Karakose et al. (2024) demonstrate that organizational leaders play a decisive role in managing change processes and fostering adaptive cultures during periods of transformation. Comparable observations were identified by Kokabi Boroujerdi et al. (2025), who found that organizational vitality in digital management environments depends heavily on leadership practices that encourage innovation and employee engagement. These findings suggest that leaders act as institutional architects who establish the conditions necessary for productive human–AI collaboration.

Governance mechanisms also emerged as a significant component of organizational enablement. Momeni et al. (2026) emphasize that AI adoption within smart governance systems requires clearly defined structures that regulate accountability, transparency, and decision authority. Similar concerns are reflected in the governance framework proposed by Pourkarimi and Aliakbari (2025), which highlights policy development, ethical oversight, stakeholder participation, and technological regulation as interconnected dimensions of AI governance. The present synthesis indicates that governance structures reduce uncertainty and provide legitimacy for AI-supported organizational decisions.

The importance of organizational learning environments further highlights the social nature of human–AI collaboration. Assefa et al. (2024) argue that learning-oriented institutions are better positioned to adapt to technological disruption because they continuously develop employee competencies and organizational knowledge. Similar findings were reported by Karanjam et al. (2017), who identified continuous learning systems as essential components of effective organizational e-learning models. Human–AI collaboration therefore appears most sustainable

in organizations that encourage experimentation, knowledge sharing, and continuous capability development rather than relying solely on technological implementation strategies.

Collaborative Value Creation and Organizational Performance

The fourth dimension identified in this study concerns the value generated through effective interaction between human and artificial intelligence capabilities. Productivity improvement, innovation enhancement, decision quality, service quality, knowledge creation, and organizational agility emerged as the dominant collaborative outcomes across the synthesized studies. Ferasso et al. (2018) argue that innovation ecosystems generate value through interactions among diverse actors rather than through isolated contributions from individual participants. The present findings suggest that human–AI collaboration follows a similar logic in which value emerges from the integration of complementary capabilities.

Productivity improvement represents the most frequently reported outcome of collaborative intelligence. Babar et al. (2025) found that human–AI collaboration in IT support services significantly enhances workflow automation, reduces operational inefficiencies, and improves user experiences. Comparable evidence was reported by Mer and Srivastava (2023), who observed that AI-enabled systems contribute to employee engagement and performance by reducing routine workload burdens. These findings indicate that productivity gains result not from workforce replacement but from the redistribution of cognitive and operational responsibilities between humans and intelligent systems.

Decision quality also emerged as a major outcome of collaborative interactions. Ofem (2024) emphasizes that AI-supported decision systems can improve analytical rigor by providing extensive data processing capabilities and predictive insights. However, human judgment remains essential for evaluating ethical implications, contextual relevance, and long-term organizational consequences. The present synthesis demonstrates that high-quality decisions are produced when analytical strengths associated with AI are balanced by human reasoning and strategic interpretation.

Innovation enhancement constitutes another significant outcome of collaborative intelligence. Zafar et al. (2025) argue that generative AI expands the boundaries of creative exploration by enabling rapid experimentation with alternative ideas and solutions. Similar findings were identified by Yahyapour et al. (2015), who demonstrate that knowledge management benefits are strengthened when organizations establish mechanisms for integrating diverse knowledge sources. Human–AI collaboration therefore contributes to innovation by facilitating new forms of knowledge recombination, creativity, and organizational learning.

Organizational agility and strategic adaptability emerged as higher-order outcomes linking collaborative intelligence to long-term competitiveness. Bhardwaj and Srivastava (2024) emphasize that dynamic capabilities enable organizations to respond effectively to environmental changes through resource reconfiguration and continuous adaptation. Similar observations were reported by Esashika et al. (2021), whose analysis of smart city development highlights the importance of adaptive governance and technological responsiveness. The findings of the present study suggest that human–AI collaboration strengthens organizational agility by enhancing information processing capacity, accelerating learning processes, and supporting strategic responsiveness.

Toward an Integrated Human–AI Collaboration Framework for Business Administration

One of the principal contributions of this study is the development of an integrated conceptual framework explaining how human and AI capabilities interact within modern business administration. Existing studies have generally examined isolated aspects of collaboration, including technology adoption, governance mechanisms, trust development, educational applications, and workflow automation. Pedrami and Vaezi (2026) note that AI implementation research often focuses on adoption factors without fully explaining how organizational value is subsequently generated. The framework proposed in this study addresses this limitation by connecting capability formation, organizational enablement, and value creation into a unified explanatory structure.

The framework positions human capability as the foundational source of contextual interpretation, ethical reasoning, creativity, communication, and strategic judgment. Costa et al. (2025) demonstrate that even highly sophisticated AI systems require human oversight to ensure validity, relevance, and methodological rigor within research environments. Similar observations were identified across educational and governance contexts where human actors retain responsibility for evaluating outcomes and managing uncertainty (Koç & Uzun, 2025; Rafael, 2026). Human capability therefore functions as the primary source of meaning-making within collaborative intelligence systems.

AI capability constitutes the second foundational element within the framework. Wu and Or (2025) propose that future human–AI collaboration systems should be designed as open and adaptive problem-solving environments capable of supporting knowledge management and collective intelligence. Consistent with this perspective, the present synthesis identifies data processing, automation, predictive analytics, and knowledge generation as the dominant

contributions of AI technologies. These capabilities expand organizational intelligence by augmenting rather than replacing human cognitive resources.

The framework further identifies organizational enablement as the mechanism that transforms human and AI capabilities into productive collaborative relationships. Lemaire et al. (2019) argue that complex organizational networks require supportive structures capable of coordinating interactions among multiple actors and knowledge sources. Similar principles are evident in AI-supported organizations where trust, governance, leadership, and learning cultures facilitate effective collaboration (Momeni et al., 2026; Feroz & Kwak, 2024). Organizational enablement therefore functions as the institutional infrastructure through which collaborative intelligence is operationalized.

The resulting framework conceptualizes human–AI collaboration as a dynamic organizational capability that continuously evolves through reciprocal interaction among human actors, intelligent technologies, and organizational systems. Fransman (2018) argues that emerging fields of research often require integrative conceptual models capable of connecting fragmented knowledge streams into coherent theoretical explanations. The present study contributes to this objective by synthesizing evidence from diverse domains and proposing a multidimensional framework applicable to modern business administration. Human–AI collaboration should therefore be understood as an organizational capability that creates sustainable value through the coordinated integration of human judgment, technological intelligence, and institutional support mechanisms.

Theoretical and Managerial Implications of Collaborative Intelligence

The findings contribute to theory development by extending existing perspectives on technology adoption toward a capability-based understanding of human–AI collaboration. Previous studies have frequently conceptualized AI implementation as a technological phenomenon driven by acceptance, usability, and infrastructure considerations. Pedrami and Gholipour (2025) demonstrate that collaborative effectiveness depends on a broader set of human, technological, and organizational factors operating simultaneously. The framework developed in this study advances this perspective by explaining how these dimensions interact to generate organizational value.

From a knowledge management perspective, the findings indicate that collaborative intelligence represents an emerging mechanism for organizational learning and knowledge creation. Jami Pour et al. (2020) identify knowledge-sharing processes as critical determinants of digital technology adoption within organizations. Similar conclusions were reported by Yahyapour et al. (2015), who emphasize the strategic value of knowledge integration for organizational performance. Human–AI collaboration appears to strengthen these processes by increasing access to information, improving analytical capabilities, and facilitating knowledge recombination.

The findings also contribute to organizational behavior literature by highlighting the continued importance of human agency in technologically advanced workplaces. Colombi Evangelista et al. (2025) argue that organizational effectiveness remains dependent upon inclusive practices that recognize individual capabilities and contextual differences. Comparable evidence was reported by Erdös et al. (2021), who found that change processes are strongly influenced by personal and contextual factors. These observations reinforce the argument that technological advancement does not diminish the importance of human participation but instead increases the strategic value of uniquely human competencies.

Several managerial implications emerge from the proposed framework. Managers should prioritize capability development programs that strengthen critical thinking, creativity, adaptability, and ethical reasoning among employees. Mer (2023) emphasizes that successful AI integration within human resource management requires continuous workforce development rather than simple technological deployment. Organizations seeking to maximize collaborative value should therefore invest simultaneously in employee development, technological infrastructure, and governance systems.

The findings additionally suggest that organizational leaders should shift their focus from automation-centered strategies toward collaboration-centered strategies. Mahajan (2026) argues that the future of AI-enabled institutions depends upon maintaining an ethical balance between human agency and technological capability. Similar concerns are reflected across governance, education, and organizational transformation studies included in this synthesis. Sustainable competitive advantage is therefore likely to emerge from organizations that successfully combine human intelligence, artificial intelligence, and institutional support into an integrated system of collaborative value creation.

CONCLUSION

This study advances the understanding of human–AI collaboration by conceptualizing it as a multidimensional organizational capability rather than merely a technology adoption phenomenon. Through a qualitative meta-synthesis of studies spanning human resource management, governance, education, digital transformation, information technology services, knowledge management, and innovation ecosystems, the findings demonstrate that sustainable human–AI collaboration emerges from the dynamic interaction among human capability, AI capability, organizational enablement, and collaborative value creation. The proposed framework contributes to the collaborative intelligence

literature by integrating previously fragmented evidence into a coherent capability-based perspective applicable to contemporary business administration. From a theoretical standpoint, the study extends AI adoption and digital transformation research by emphasizing complementarity between human and artificial intelligence instead of technological substitution. From a managerial perspective, the findings highlight that successful AI implementation requires balanced investments in technological infrastructure, workforce capability development, leadership, governance mechanisms, and organizational learning to foster productive collaboration between humans and AI systems.

Despite these contributions, several limitations should be acknowledged. The synthesis relies exclusively on published qualitative and meta-synthesis studies, which may not fully capture rapidly evolving organizational practices related to AI adoption. Furthermore, the evidence originates from multiple sectors with diverse institutional characteristics, potentially limiting the direct transferability of specific findings across industries, while the resulting framework remains conceptual and awaits empirical validation. Future research should therefore examine the proposed relationships through quantitative, mixed-method, and longitudinal designs across different organizational and cultural contexts, while also investigating sector-specific configurations of human–AI collaboration in industries such as healthcare, finance, manufacturing, and public administration. Additional attention should be directed toward ethical governance, algorithmic transparency, workforce transformation, and collaborative decision-making as AI technologies continue to evolve. Beyond its academic contribution, the framework offers practical guidance for organizations in designing collaborative systems that integrate human judgment with artificial intelligence, provides policymakers with insights into responsible AI governance, and reinforces the view that AI should function as a complementary resource capable of enhancing innovation, improving decision quality, and supporting sustainable organizational development in the digital era.

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AI DISCLOSURE STATEMENT

Artificial Intelligence (AI) tools, specifically ChatGPT developed by OpenAI, were utilized solely to assist in language refinement, grammar improvement, idea organization, and editorial support during the preparation of this manuscript. The AI tool was not used to generate research data, conduct literature selection, perform data extraction, undertake coding procedures, synthesize findings, interpret results, or formulate the study's conclusions.

All stages of the research process, including research design, study selection, quality appraisal, thematic analysis, meta-synthesis procedures, conceptual framework development, interpretation of findings, and final manuscript preparation, were conducted, reviewed, and validated by the author. The author assumes full responsibility for the accuracy, originality, integrity, and scholarly quality of the work presented in this article.

The use of AI complied with the ethical guidelines and publication standards applicable to academic research. No AI system was credited as an author, and all intellectual contributions, analytical judgments, and research decisions remain the sole responsibility of the author.

Walid In'am Ahmad (Corresponding Author)
Department of Sharia Economics, Faculty of Islamic Economics and Business
Universitas Islam Negeri Sunan Ampel Surabaya
Surabaya, Indonesia
Email: walidinamahmad@gmail.com

Solehudin
Department of Nursing, Faculty of Health Sciences
Universitas Indonesia Maju
Jakarta, Indonesia
Email: solehsolehudin412@gmail.com