



HUMAN-AI COLLABORATION AND EMPLOYEE ENGAGEMENT: THE MEDIATING ROLE OF PSYCHOLOGICAL EMPOWERMENT IN AI-DRIVEN WORKPLACES

Dr.Rathlavathu Prasanthi¹, Dr.Chandra Babu Jangam²

¹Independent Researcher, HR Consultant and Guest Faculty, Road No. 6, Sri Srinivasa Puram Colony,
Behind Government Area Hospital, Vanasthalipuram, Hyderabad – 500070, Telangana, India.

Orcid ID: <https://orcid.org/0009-0005-8805-746X>

²Superintendent, Internal Quality Assurance Cell, Sri Krishnadevaraya University, Ananthapuramu – 515 003, Andhra Pradesh, India, Orcid ID: <https://orcid.org/0009-0000-2621-8727>

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ABSTRACT

The rapid advancement of Artificial Intelligence (AI) has transformed organizational processes, employee roles and workplace dynamics, leading to the emergence of **Human-AI Collaboration** as a defining feature of modern organizations. While AI technologies enhance operational efficiency, decision-making and innovation, their implications for employee engagement remain an important area of scholarly inquiry. This study examines the relationship between Human-AI Collaboration and Employee Engagement, with particular emphasis on the mediating role of **Psychological Empowerment** in AI-driven workplaces.

The study adopts a **Systematic Literature Review (SLR)** methodology following the **PRISMA guidelines**. Relevant peer-reviewed articles published between 2022 and 2025 were retrieved from major academic databases, including Scopus, Web of Science, ScienceDirect, Emerald, SpringerLink and Google Scholar. Following a rigorous screening process, 42 studies were selected for final review and synthesis. The analysis integrates insights from Human Resource Management, Organizational Behavior, Psychology and Artificial Intelligence to identify key themes, theoretical foundations and research trends.

The findings reveal that Human-AI Collaboration positively influences Employee Engagement by improving work efficiency, facilitating continuous learning and enabling employees to focus on meaningful and value-adding activities. The review further demonstrates that **Psychological Empowerment**, comprising meaning, competence, self-determination and impact, serves as a critical mediating mechanism linking Human-AI Collaboration and Employee Engagement. Additionally, trust in AI, organizational culture and ethical governance emerge as important contextual factors influencing successful AI adoption.

The study contributes to the literature by proposing an integrated conceptual framework that explains how Human-AI Collaboration enhances Employee Engagement through Psychological Empowerment. The findings offer valuable implications for HR managers, organizational leaders, policymakers and AI system designers seeking to develop human-centered AI strategies that promote employee well-being, engagement and sustainable organizational performance.

KEYWORDS: Human-AI Collaboration, Employee Engagement, Psychological Empowerment, Artificial Intelligence, Trust in AI, Human Resource Management, Ethical Governance.

1. INTRODUCTION

1.1 Background of the Study

The rapid advancement of Artificial Intelligence (AI) has emerged as one of the most transformative technological developments of the twenty-first century. AI technologies, including machine learning, natural language processing, predictive analytics, robotics and generative AI systems, are increasingly integrated into organizational processes across industries. Organizations worldwide are adopting AI-driven solutions to enhance operational efficiency, improve decision-making, automate repetitive tasks and develop innovative business models. Consequently, AI has evolved from being merely a technological tool to becoming a strategic organizational

resource capable of reshaping workplace structures, employee roles and organizational performance. The widespread adoption of AI marks a significant transformation in how organizations operate, compete and manage human resources in contemporary workplaces.

The AI revolution has fundamentally altered traditional organizational practices through intelligent automation and data-driven decision-making. Organizations increasingly utilize AI applications in recruitment, performance management, customer relationship management, supply chain optimization and strategic planning. These technologies improve productivity, reduce human error and accelerate information processing by analyzing vast amounts of data in real time. As a result, organizations are



transitioning from conventional work models to digitally enabled environments where AI technologies play a central role in everyday operations. This transformation has generated growing scholarly interest in understanding the impact of AI on employee experiences, organizational behavior and workplace dynamics.

One of the most significant developments associated with AI adoption is the emergence of Human–AI Collaboration. Unlike earlier technological innovations that primarily focused on replacing human labor through automation, contemporary AI applications emphasize collaboration between humans and intelligent systems. Human–AI Collaboration refers to the interactive partnership in which employees and AI systems combine their respective strengths to achieve organizational objectives. While AI contributes computational efficiency, predictive capabilities and data-processing speed, humans provide creativity, emotional intelligence, ethical judgment, critical thinking and contextual understanding. The integration of these complementary capabilities creates opportunities for enhanced innovation, productivity and organizational effectiveness.

Human–AI Collaboration is increasingly becoming a defining characteristic of modern workplaces. Employees now work alongside AI-powered tools that support decision-making, information analysis, problem-solving and task management. AI systems assist managers in forecasting market trends, help healthcare professionals improve diagnostic accuracy and enable customer service representatives to provide personalized solutions. Rather than replacing employees, AI technologies augment human capabilities by allowing individuals to focus on strategic, creative and value-added activities. Consequently, organizations are adopting collaborative intelligence models in which human expertise and machine intelligence operate together to achieve superior outcomes.

Despite its potential benefits, Human–AI Collaboration also presents significant organizational and psychological challenges. Employees may experience concerns regarding job security, skill obsolescence and the need to continuously adapt to rapidly evolving technologies. Additionally, increasing reliance on algorithmic decision-making raises issues related to transparency, fairness, accountability and employee autonomy. These challenges highlight the importance of understanding how employees perceive and respond to AI-driven work environments. The success of Human–AI Collaboration depends not only on technological capabilities but also on organizational efforts to foster trust, engagement, adaptability and positive employee attitudes toward technological change.

The growing integration of AI has also transformed the nature of work. Routine and repetitive tasks are increasingly automated, enabling employees to focus on innovation, relationship management and strategic decision-making. While AI creates opportunities for professional development, creativity and enhanced job performance, it may also generate uncertainty, resistance to change and concerns regarding employee relevance in increasingly automated workplaces. Consequently, organizations must adopt new approaches to leadership, talent management, organizational culture and employee development.

In this evolving context, employee engagement has become a critical factor in determining the success of AI adoption initiatives. Human–AI Collaboration can enhance engagement when employees perceive AI as a supportive partner that improves their capabilities and contributes to meaningful work experiences. Conversely, poorly implemented AI systems may increase stress, reduce autonomy and negatively affect workplace satisfaction. Therefore, understanding the mechanisms through which Human–AI Collaboration influences employee engagement is essential. Such understanding can help organizations develop human-centered AI strategies that balance technological innovation with employee well-being, empowerment and sustainable organizational performance.

1.2 Problem Statement

The increasing adoption of Artificial Intelligence (AI) in organizations has transformed workplace processes and employee roles. While AI enhances efficiency and productivity, it also raises concerns regarding employee engagement in AI-driven workplaces. Employees may experience job insecurity, reduced autonomy, skill obsolescence and uncertainty about their future roles. Furthermore, the psychological consequences of AI adoption, including technostress, anxiety, diminished trust and resistance to change, can negatively affect motivation and workplace commitment. Despite the growing prevalence of Human-AI collaboration, limited research has examined how organizations can sustain employee engagement while addressing the psychological challenges associated with AI-enabled work environments.

1.3 Research Gap

Although research on Artificial Intelligence (AI), Human-AI collaboration and employee engagement has expanded significantly in recent years, important gaps remain in the existing literature. Most studies have focused on the technological, operational and performance outcomes of AI adoption, while limited attention has been given to the psychological mechanisms that explain how Human-AI collaboration influences employee engagement. In particular, psychological empowerment—comprising meaning, competence, self-determination and impact—has received insufficient examination as a mediating variable in AI-driven workplaces. Furthermore, existing evidence is fragmented across multiple disciplines, including Human Resource Management (HRM), Artificial Intelligence, organizational behavior and psychology, resulting in a lack of an integrated framework explaining the relationship between Human-AI collaboration, psychological empowerment and employee engagement. Existing studies have primarily examined AI adoption, technology acceptance and organizational performance independently. Limited research has simultaneously examined Human-AI Collaboration, Psychological Empowerment and Employee Engagement within a unified theoretical framework. Moreover, no comprehensive SLR has synthesized recent evidence explaining the mediating role of Psychological Empowerment in AI-driven workplaces. To the best of the author's knowledge, no prior SLR has



comprehensively synthesized evidence on the mediating role of Psychological Empowerment in the Human–AI Collaboration–Employee Engagement relationship.

1.4 Research Objectives

1. To examine Human-AI Collaboration in workplaces.
2. To analyze Employee Engagement in AI-driven organizations.
3. To investigate Psychological Empowerment as a mediating variable.
4. To propose a conceptual framework linking these constructs.

1.5 Significance of the Study

This study is significant because it provides a comprehensive understanding of how Human-AI collaboration influences employee engagement in AI-driven workplaces. By examining psychological empowerment as a mediating mechanism, the study contributes to bridging the gap between technological adoption and employee behavioral outcomes. It integrates insights from Human Resource Management, Artificial Intelligence, organizational behavior and psychology to develop a holistic conceptual framework. The findings will assist organizations, HR professionals and policymakers in designing

human-centric AI implementation strategies that enhance employee engagement, empowerment and well-being while maximizing the benefits of AI adoption and ensuring sustainable organizational performance.

1.6 Research Methodology

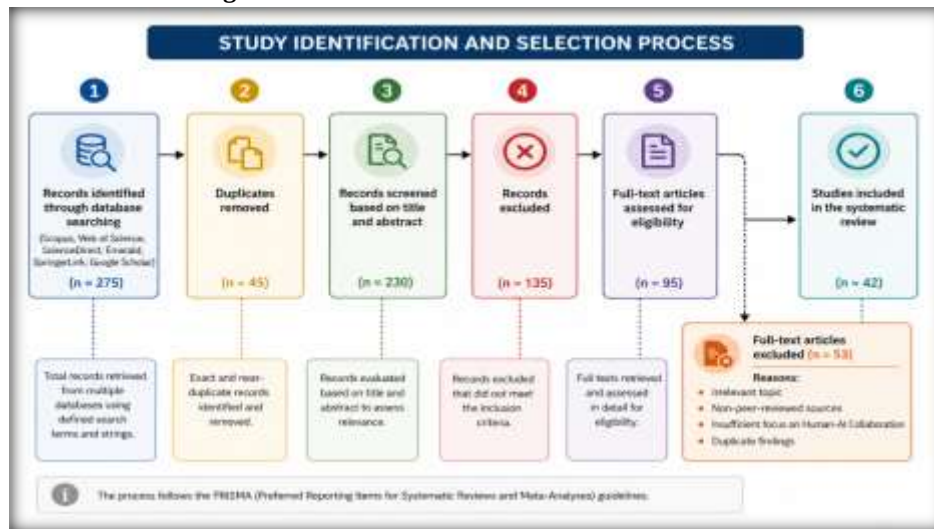
This study employs a **Systematic Literature Review (SLR)** following **PRISMA guidelines** to examine Human–AI Collaboration, Psychological Empowerment and Employee Engagement in AI-driven workplaces. Relevant studies were sourced from **Scopus, Web of Science, ScienceDirect, Emerald, SpringerLink and Google Scholar** using keywords such as Human–AI Collaboration, Employee Engagement, Psychological Empowerment, Trust in AI and Human-Centered AI. The review included **peer-reviewed English-language journal articles published between 2022 and 2025** focusing on AI-enabled workplaces, organizational behavior, psychology and HRM. Conference papers, book chapters, editorials, dissertations and non-English publications were excluded. From **275 identified records**, 45 duplicates were removed, and after title, abstract and full-text screening, **42 studies** met the inclusion criteria. The selected articles were analyzed to identify key themes, theoretical foundations, research gaps and emerging trends, forming the basis of the proposed conceptual framework.

Table 1. Search Strategy

Component	Description
Review Method	Systematic Literature Review (SLR) following PRISMA Guidelines
Databases Searched	Scopus, Web of Science, ScienceDirect, Emerald Insight, SpringerLink, and Google Scholar
Search Period	January 2022 – March 2025
Keywords Used	“Human–AI Collaboration”, “Artificial Intelligence in the Workplace”, “Employee Engagement”, “Psychological Empowerment”, “Trust in AI”, “Human-Centered AI”, “AI-Driven Workplace”
Inclusion Criteria	Peer-reviewed journal articles; English language; published between 2022–2025; studies related to AI, HRM, Organizational Behavior, Employee Engagement, and Psychological Empowerment
Exclusion Criteria	Conference papers, book chapters, editorials, dissertations, non-English publications, duplicate records, and studies not directly related to Human–AI Collaboration
Initial Records Identified	275
Duplicates Removed	45
Records Screened	230
Full-Text Articles Assessed	95
Articles Excluded After Full-Text Review	53
Final Studies Included	42
Data Analysis Approach	Thematic analysis and synthesis of theoretical foundations, empirical findings, research gaps, and emerging trends

Source: Developed by the author based on the PRISMA-guided systematic review process.

Figure 1. PRISMA-Based Article Selection Process



Source: Developed by the author following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

The study adopted a PRISMA-guided systematic review process to identify, screen and select relevant literature. A total of 275 records were identified from major academic databases, including Scopus, Web of Science, ScienceDirect, Emerald, SpringerLink and Google Scholar. After removing duplicates and screening titles and abstracts, 95 full-text articles were assessed for eligibility. Following the application of inclusion and exclusion criteria, 42 studies were retained for the final review and synthesis.

2. THEORETICAL FOUNDATION

The present study is grounded in multiple theoretical perspectives that collectively explain the relationship between Human-AI collaboration, psychological empowerment and employee engagement in AI-driven workplaces. As organizations increasingly integrate artificial intelligence into their operations, understanding employee responses to technological transformation requires a multidimensional theoretical approach. The Job Demands–Resources (JD-R) Theory, Psychological Empowerment Theory, Social Exchange Theory, Technology Acceptance Perspective and Human-Centered AI Framework provide a comprehensive foundation for examining how AI influences employee attitudes and workplace behaviors.

2.1 Job Demands–Resources (JD-R) Theory

The Job Demands–Resources (JD-R) Theory, developed by Bakker and Demerouti, explains employee well-being and engagement through the balance between job demands and job resources. Job demands refer to physical, psychological, social, or organizational aspects of work that require sustained effort and may result in stress or burnout. In contrast, job resources are factors that help employees achieve work goals, reduce job-related strain and promote personal growth and development.

In AI-driven workplaces, Human-AI collaboration can function as both a job demand and a job resource. Employees may face increased learning requirements, technological complexity and adaptation challenges, which constitute job demands. Simultaneously, AI systems can reduce repetitive tasks, provide decision support, improve efficiency and enhance productivity, thereby serving as valuable job resources. According to the JD-R Theory, employee engagement increases when resources outweigh demands. Thus, organizations that effectively implement AI technologies while providing adequate support, training and autonomy can foster higher levels of employee engagement and well-being.

2.2 Psychological Empowerment Theory

Psychological Empowerment Theory, proposed by Spreitzer, serves as a central theoretical foundation for this study. The theory defines psychological empowerment as an intrinsic motivational state reflected through four dimensions: meaning, competence, self-determination and impact. Meaning refers to the alignment between an individual's values and work tasks, competence represents confidence in one's abilities, self-determination reflects autonomy in decision-making and impact denotes the ability to influence organizational outcomes.

In the context of Human-AI collaboration, psychological empowerment provides an explanation for how employees interpret and respond to AI-enabled work environments. When AI systems support employees in performing meaningful tasks, enhance their capabilities and allow them to retain autonomy and influence, employees are likely to feel empowered. This empowered state contributes to higher motivation, job satisfaction and engagement. Therefore, Psychological Empowerment Theory offers a valuable framework for understanding the mediating role of empowerment in the relationship between Human-AI collaboration and employee engagement.



2.3 Social Exchange Theory

Social Exchange Theory, developed by Blau, suggests that relationships are built on reciprocal exchanges of benefits and obligations. Employees tend to respond positively when they perceive that their organization values their contributions and supports their well-being. Such positive exchanges create feelings of trust, commitment and loyalty, which subsequently influence workplace attitudes and behaviors.

In AI-driven organizations, employees evaluate whether technological changes are implemented in ways that benefit them or threaten their interests. When organizations provide adequate training, transparent communication, career development opportunities and support during AI adoption, employees perceive these actions as organizational investments in their success. Consequently, they are more likely to reciprocate through increased engagement, commitment and cooperation. Social Exchange Theory therefore explains how organizational support during AI implementation can strengthen employee engagement by fostering positive perceptions and reciprocal behaviors.

2.4 Technology Acceptance Perspective

The Technology Acceptance Perspective, particularly the Technology Acceptance Model (TAM) developed by Davis, explains how individuals adopt and use new technologies. The model proposes that perceived usefulness and perceived ease of use are the primary determinants of technology acceptance. Employees are more likely to embrace technological innovations when they believe the technology will improve their job performance and can be used without significant difficulty.

Within Human-AI collaboration contexts, employees' acceptance of AI technologies significantly influences their workplace experiences. If AI systems are perceived as beneficial, user-friendly and supportive of work objectives, employees are more likely to develop positive attitudes toward AI integration. Conversely, perceptions of complexity, uncertainty, or threat may result in resistance and reduced engagement. The Technology Acceptance Perspective thus provides valuable insights into the factors influencing employee willingness to collaborate with AI systems and adapt to digital transformation.

2.5 Human-Centered AI Framework

The Human-Centered AI Framework emphasizes the design and implementation of AI systems that prioritize human values, needs and well-being. Unlike technology-centric approaches that focus primarily on efficiency and automation, Human-Centered AI advocates for transparency, fairness, accountability, explainability and human oversight in AI applications.

This framework is particularly relevant in contemporary workplaces where employees increasingly interact with intelligent systems. Human-Centered AI recognizes that successful AI adoption depends not only on technological performance but also on employee trust, autonomy and psychological well-being. By ensuring that AI systems complement rather than replace human capabilities, organizations

can create environments that support empowerment and engagement. Consequently, the Human-Centered AI Framework provides a practical and ethical foundation for understanding how Human-AI collaboration can contribute to sustainable organizational performance while maintaining employee-centered workplace practices.

3. LITERATURE REVIEW

3.1 Human-AI Collaboration

3.1.1 Concept and Definitions

Human-AI Collaboration refers to the synergistic interaction between human employees and artificial intelligence systems to accomplish organizational objectives more effectively than either could achieve independently. Unlike traditional automation, which focuses on replacing human effort, Human-AI collaboration emphasizes complementarity, where AI contributes computational intelligence, predictive capabilities and data-processing efficiency, while humans provide creativity, emotional intelligence, ethical judgment and contextual understanding. Recent studies indicate that organizations increasingly view AI as a collaborative partner rather than a replacement for human labor. Sun et al. (2025) found that employee-AI collaboration significantly enhances work engagement when employees perceive AI as a supportive resource that augments their capabilities rather than threatens their employment.

3.1.2 Dimensions of Human-AI Collaboration

Human-AI collaboration encompasses several dimensions, including task augmentation, decision support, knowledge sharing, communication assistance and adaptive learning. AI technologies assist employees in performing repetitive tasks, generating insights from large datasets and facilitating informed decision-making. Research by Liu and Li (2025) demonstrated that Human-AI collaboration improves workplace outcomes through enhanced intrinsic motivation and work engagement. Their findings suggest that AI-supported work environments provide employees with valuable job resources that strengthen performance and productivity.

Additionally, AI-enabled collaboration promotes workplace learning and skill development. Employees increasingly rely on AI systems to acquire new knowledge, improve problem-solving capabilities and adapt to changing work requirements. Studies examining AI productivity tools reveal that AI can foster continuous learning and collaborative knowledge-sharing practices, contributing to organizational innovation and employee development.

3.1.3 Trust and Human-AI Interaction

Trust represents a fundamental prerequisite for successful Human-AI collaboration. Employees must perceive AI systems as reliable, transparent, fair and aligned with organizational values before integrating them into their daily work processes. McGrath et al. (2024) proposed the Collaborative Human-AI Trust (CHAI-T) framework, emphasizing that trust evolves through repeated interactions between humans and AI systems.



The framework highlights the importance of transparency, system reliability and contextual understanding in fostering sustainable Human-AI partnerships.

Recent workplace studies further indicate that employee trust significantly influences AI adoption and utilization. Research shows that organizations providing AI literacy training, transparent communication and ethical governance frameworks achieve higher levels of trust and acceptance among employees. Conversely, algorithmic opacity and concerns regarding bias often reduce employee confidence and willingness to collaborate with AI systems.

3.1.4 Challenges of Human-AI Collaboration

Despite its benefits, Human-AI collaboration introduces several challenges. Employees frequently report concerns regarding job insecurity, technological complexity, reduced autonomy and skill obsolescence. Jia (2025) found that job insecurity associated with AI adoption can generate emotional exhaustion and resistance to technological learning. Similarly, Wang et al. (2026) demonstrated that excessive Human-AI collaboration complexity increases technological learning anxiety and negatively affects work engagement.

Moreover, employee anxiety concerning AI-based management systems continues to grow. Surveys indicate that while employees generally support AI-assisted work, they remain uncomfortable with AI replacing human managers in decision-making processes involving recruitment, compensation and performance evaluation.

3.2 Employee Engagement in AI-Driven Workplaces

3.2.1 Concept of Employee Engagement

Employee engagement refers to a positive psychological state characterized by vigor, dedication and absorption in work activities. Engaged employees demonstrate enthusiasm, commitment and emotional attachment to organizational objectives. Contemporary research suggests that engagement remains a critical determinant of organizational performance in digitally transformed workplaces. According to the Job Demands-Resources framework, engagement develops when employees possess sufficient resources to manage workplace demands effectively.

3.2.2 AI and Employee Motivation

AI technologies can significantly influence employee motivation. By automating routine tasks and supporting complex decision-making, AI enables employees to focus on meaningful and creative activities. Sun et al. (2025) reported that Human-AI collaboration enhances work engagement through increased perceptions of meaningful work and creative self-efficacy. Similarly, Dixit (2024) found that AI-driven work environments positively affect digital employee engagement through enhanced job autonomy and learning orientation.

Research conducted across multiple industries further indicates that AI adoption contributes to higher productivity, improved work quality and increased employee satisfaction when employees perceive AI as a supportive technology.

3.2.3 Opportunities and Challenges

AI-driven workplaces create substantial opportunities for employee development, innovation and productivity enhancement. Human-AI collaboration facilitates knowledge acquisition, flexible work arrangements and improved decision quality. Fiegler-Rudol et al. (2025) highlighted AI's potential to improve workplace well-being, safety and productivity through intelligent human-machine interaction.

However, AI adoption also introduces challenges such as technostress, digital fatigue, privacy concerns and job insecurity. Employee well-being studies reveal that AI may simultaneously improve efficiency while creating anxiety regarding employment stability and technological dependence. The outcomes largely depend on organizational implementation strategies and employee support systems.

3.2.4 Organizational Factors Influencing Engagement

Leadership support, organizational culture, training opportunities and ethical AI governance significantly influence employee engagement. Studies suggest that organizations fostering transparency, trust and continuous learning achieve stronger engagement outcomes during AI adoption. Recent evidence also demonstrates that employees are more likely to embrace AI when organizations provide adequate training and opportunities for participation in technology implementation decisions.

3.3 Psychological Empowerment

3.3.1 Meaning

Meaning refers to the degree to which employees perceive their work as valuable and aligned with personal values. AI can enhance meaningfulness by reducing routine activities and enabling employees to focus on strategic and creative responsibilities. Studies indicate that meaningful work serves as an important psychological pathway linking Human-AI collaboration to employee engagement.

3.3.2 Competence

Competence reflects employees' confidence in their ability to perform work effectively. Human-AI collaboration often requires new digital skills and technological literacy. Research shows that organizations providing AI-related training significantly improve employee competence, confidence and adaptability in technology-rich environments.

3.3.3 Self-Determination

Self-determination refers to perceived autonomy and control over work activities. Employees experience greater empowerment when AI systems support rather than dictate decisions. Research on Human-AI collaboration suggests that maintaining human oversight and decision authority strengthens perceptions of autonomy and enhances workplace motivation.



3.3.4 Impact

3.3.5 Empowerment in Digital Workplaces

Psychological empowerment has become increasingly important in digital workplaces characterized by rapid technological transformation. Recent studies indicate that empowered employees adapt more effectively to AI-driven changes and exhibit higher levels of engagement and well-being.

Human-centered AI frameworks emphasize transparency, trust, employee participation and ethical governance as critical factors supporting empowerment. Consequently, psychological empowerment emerges as a vital mechanism connecting Human-AI collaboration with positive employee outcomes, making it a central construct for understanding engagement in AI-enabled organizations.

Table 2. Summary of Key Studies

Author(s) & Year	Study Focus	Key Findings	Research Gap Identified
Bakker & Demerouti (2022)	Job Demands–Resources (JD-R) Theory	Job resources enhance employee engagement and well-being, while excessive demands may reduce motivation.	Limited application of JD-R Theory in AI-enabled workplace contexts.
Zirar, Ali & Islam (2023)	Human–AI Coexistence in Organizations	Identified emerging themes of AI integration, workforce adaptation and human–AI interaction.	Lack of empirical and psychological explanations linking AI collaboration to employee engagement.
Umar Baki, Rasdi & Ahmad (2023)	AI in Human Resource Management	AI improves HR efficiency, recruitment and workforce analytics.	Limited focus on employee empowerment and engagement outcomes.
McGrath, Costello & van der Schyff (2024)	Trust in Human–AI Collaboration	Developed the CHAI-T framework emphasizing trust, transparency and reliability in AI systems.	Employee engagement consequences of AI trust remain underexplored.
Sun, Zhang & Wang (2025)	Human–AI Collaboration and Work Engagement	Human–AI collaboration positively influences engagement through meaningful work and creative self-efficacy.	Psychological empowerment was not examined as a mediating mechanism.
Liu & Li (2025)	Human–AI Collaboration and Safety Performance	AI functions as a job resource, improving employee performance and engagement.	Focused primarily on safety outcomes rather than empowerment dimensions.
Jia (2025)	AI-Related Job Insecurity	AI-driven job insecurity increases emotional exhaustion and reduces engagement.	Did not investigate positive psychological mechanisms that may offset negative effects.
Wang, Chen & Li (2025)	Human–AI Collaboration Complexity	Collaboration complexity can create technological learning anxiety and lower engagement.	Need for studies examining empowerment and organizational support mechanisms.
Fiegler-Rudol, Schwaiger & Reichel (2025)	Human–AI Collaboration and Workplace Well-being	Human–AI interaction can improve productivity, well-being and organizational sustainability.	Limited examination of mediating psychological factors.
Callari & Puppione (2025)	Generative AI and Workplace Learning	AI tools enhance workplace learning, knowledge sharing and employee involvement.	Relationship between learning benefits and employee engagement remains insufficiently explained.

Synthesis

The reviewed studies collectively suggest that Human–AI Collaboration can generate positive organizational and employee outcomes through improved productivity, learning opportunities and workplace support. However, existing literature primarily focuses on technological adoption, trust, performance and job insecurity. Very few studies have examined **Psychological Empowerment (Meaning, Competence, Self-Determination and Impact)** as the underlying mechanism connecting Human–AI Collaboration with **Employee Engagement**. This gap justifies the development of the proposed conceptual framework in the present study.

Although existing studies provide valuable insights into AI adoption, employee engagement and workplace outcomes, findings remain fragmented across disciplines. Most studies focus on technological efficiency, trust and performance outcomes, while limited attention has been given to the psychological mechanisms through which Human–AI Collaboration influences employee engagement. This fragmentation underscores the need for an integrated framework that explains the mediating role of Psychological Empowerment.



4. RELATIONSHIP BETWEEN HUMAN-AI COLLABORATION AND EMPLOYEE ENGAGEMENT

4.1 Positive Outcomes

Human-AI collaboration has emerged as a significant determinant of employee engagement in modern organizations. By automating routine and repetitive tasks, AI enables employees to focus on higher-value activities such as problem-solving, creativity, innovation and strategic decision-making. This shift enhances employees' perceptions of meaningful work and contributes to higher levels of motivation and job satisfaction. Recent studies have demonstrated that AI-assisted work environments improve employee productivity, learning opportunities and work quality, thereby strengthening engagement. Furthermore, AI-driven systems provide decision support, personalized learning and performance feedback, enabling employees to perform more effectively and confidently. As a result, employees are more likely to experience vigor, dedication and absorption, which are the core dimensions of employee engagement.

4.2 Negative Outcomes

Despite its potential benefits, Human-AI collaboration may also generate negative consequences for employee engagement. The introduction of AI technologies often creates concerns regarding job displacement, skill obsolescence and reduced autonomy. Employees may perceive AI as a threat to their professional identity and future career prospects, resulting in anxiety and resistance to technological change. Excessive reliance on algorithmic systems can further diminish employees' sense of control over work processes and decision-making. Additionally, AI-driven monitoring and performance evaluation systems may increase perceptions of surveillance and work pressure, contributing to technostress and emotional exhaustion. These factors can reduce employee motivation and weaken organizational commitment if not effectively managed.

4.3 Trust as a Facilitator

Trust serves as a critical facilitating mechanism in the relationship between Human-AI collaboration and employee engagement. Employees are more likely to embrace AI technologies when they perceive them as reliable, transparent, fair and supportive of their work objectives. Trust enhances employees' willingness to utilize AI-generated recommendations and collaborate with intelligent systems. Explainable AI, transparent communication, ethical governance and employee participation in AI implementation processes contribute significantly to building trust. When employees trust AI systems and the organizations deploying them, they are more likely to perceive technological change as an opportunity rather than a threat, thereby strengthening engagement and workplace commitment.

4.4 Evidence from Recent Studies

Recent empirical studies provide substantial evidence supporting the relationship between Human-AI collaboration and employee engagement. Sun et al. (2025) found that Human-AI

collaboration positively influences work engagement through enhanced meaningfulness and creative self-efficacy. Liu and Li (2025) reported that AI-assisted work environments improve safety performance and employee engagement by functioning as valuable job resources. Similarly, Callari and Puppione (2025) observed that generative AI tools support workplace learning and collaborative knowledge sharing, thereby enhancing employee involvement and motivation. However, Jia (2025) highlighted that AI-related job insecurity can negatively affect engagement through emotional exhaustion. Collectively, these findings suggest that the impact of Human-AI collaboration on employee engagement depends largely on organizational support, employee trust and the manner in which AI technologies are implemented and managed.

5. PSYCHOLOGICAL EMPOWERMENT AS A MEDIATING MECHANISM

5.1 Theoretical Justification

Psychological empowerment provides a strong theoretical explanation for understanding how Human-AI collaboration influences employee engagement. Rooted in Psychological Empowerment Theory, empowerment is conceptualized as an intrinsic motivational state comprising four dimensions: meaning, competence, self-determination and impact. In AI-driven workplaces, employees continuously interact with intelligent systems that reshape job roles, decision-making processes and work experiences. Human-AI collaboration can positively influence employees' perceptions of empowerment by enhancing their capabilities, increasing access to information and enabling participation in more meaningful tasks. According to the Job Demands-Resources (JD-R) Theory, such psychological resources contribute significantly to employee motivation and engagement. Consequently, psychological empowerment serves as a critical mediating mechanism through which the benefits of Human-AI collaboration are translated into positive workplace outcomes.

5.2 Mediation Pathways

Human-AI Collaboration → Meaning

Human-AI collaboration can enhance employees' perceptions of meaningful work by reducing repetitive and routine activities. When AI systems handle administrative and computational tasks, employees can focus on strategic, creative and value-adding responsibilities. This enables employees to perceive greater significance and purpose in their work, thereby strengthening the meaning dimension of psychological empowerment.

Human-AI Collaboration → Competence

AI technologies provide employees with access to advanced analytical tools, real-time information and personalized learning opportunities. Continuous interaction with AI systems helps employees acquire new knowledge and develop digital competencies required in modern workplaces. As employees become more capable of performing their tasks effectively, their

confidence and perceived competence increase, strengthening psychological empowerment.

Human-AI Collaboration → Self-Determination

Effective Human-AI collaboration can support employee autonomy by providing intelligent recommendations while preserving human decision-making authority. AI systems can assist employees in making informed decisions without eliminating their discretion or control. When employees perceive that they retain authority over work processes and outcomes, their sense of self-determination is enhanced.

Human-AI Collaboration → Impact

AI systems enable employees to make better decisions, improve productivity and contribute more effectively to organizational objectives. Access to intelligent insights and predictive analytics amplifies employees' ability to influence outcomes and create value. Consequently, employees develop stronger perceptions that their actions have a meaningful impact on organizational success.

5.3 Psychological Empowerment → Employee Engagement

Psychological empowerment is widely recognized as a significant predictor of employee engagement. Employees who perceive their work as meaningful, feel competent in their abilities, experience autonomy in decision-making and believe they can influence organizational outcomes are more likely to

exhibit vigor, dedication and absorption in their work. Empowered employees demonstrate higher motivation, commitment, job satisfaction and willingness to contribute beyond formal job requirements. In AI-driven workplaces, psychological empowerment helps employees adapt to technological change while maintaining positive attitudes toward their work. Therefore, empowerment functions as a crucial psychological resource that strengthens employee engagement and overall organizational effectiveness.

5.4 Proposed Mediation Framework

Based on the existing literature, it is proposed that Human-AI collaboration positively influences employee engagement through psychological empowerment. Human-AI collaboration enhances employees' perceptions of meaning, competence, self-determination and impact, which collectively constitute psychological empowerment. These empowerment dimensions subsequently foster higher levels of employee engagement by increasing motivation, commitment and involvement in work activities. Thus, psychological empowerment serves as a mediating mechanism that explains how AI-enabled work environments contribute to positive employee outcomes. The proposed framework suggests that organizations seeking to maximize the benefits of Human-AI collaboration should focus on creating empowering work environments that support employee autonomy, skill development, meaningful work experiences and organizational influence.

6. CONCEPTUAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Figure 2. Conceptual Framework of the Study



Source: Developed by the author based on Psychological Empowerment Theory (Spreitzer, 1995), Employee Engagement Theory (Kahn, 1990), JD-R Theory (Bakker & Demerouti, 2022), and recent Human-AI Collaboration literature.

Hypothesis Development

- H1:** Human-AI Collaboration positively influences Psychological Empowerment.
- H2:** Psychological Empowerment positively influences Employee Engagement.

- H3:** Human-AI Collaboration positively influences Employee Engagement.
- H4:** Psychological Empowerment mediates the relationship between Human-AI Collaboration and Employee Engagement.



- H5:** Trust in AI positively moderates the relationship between Human–AI Collaboration and Employee Engagement.
- H6:** Organizational Culture positively moderates the relationship between Human–AI Collaboration and Employee Engagement.
- H7:** Ethical Governance positively moderates the relationship between Human–AI Collaboration and Employee Engagement.

7. AI-DRIVEN HRM PRACTICES AND EMPOWERMENT

The integration of Artificial Intelligence (AI) into Human Resource Management (HRM) has transformed traditional HR functions by improving efficiency, decision-making accuracy and employee experiences. AI-driven HRM practices not only streamline organizational processes but also contribute to employee empowerment by enhancing competence, autonomy and access to information. As organizations increasingly adopt AI technologies, understanding their impact on employee empowerment becomes essential for ensuring sustainable workforce engagement and performance.

7.1 AI in Recruitment

AI has significantly revolutionized recruitment and talent acquisition processes. AI-powered recruitment systems can screen resumes, identify suitable candidates, conduct preliminary assessments and predict candidate-job fit with greater speed and accuracy than traditional methods. These technologies reduce administrative burdens on HR professionals and improve the efficiency of hiring decisions. From an empowerment perspective, AI-based recruitment promotes fairness and transparency when designed appropriately, enabling organizations to attract talent based on objective criteria. Furthermore, employees entering organizations through efficient and transparent recruitment systems are more likely to perceive organizational support and trust, contributing to positive workplace experiences.

7.2 AI in Performance Management

Performance management has become increasingly data-driven through AI-enabled systems. AI technologies facilitate continuous performance monitoring, real-time feedback and predictive performance analysis. Unlike traditional annual appraisal systems, AI-supported performance management provides employees with timely insights into their strengths, development needs and career progression opportunities. Such systems enhance employee competence by helping individuals understand performance expectations and identify improvement areas. However, organizations must ensure that AI-driven evaluations remain transparent and free from bias to maintain employee trust and empowerment.

7.3 AI in Learning and Development

AI has transformed learning and development by providing personalized training experiences tailored to individual

employee needs. Intelligent learning platforms analyze employee competencies, identify skill gaps and recommend customized learning pathways. These systems support continuous learning and facilitate the acquisition of digital skills required in AI-driven workplaces. By enabling employees to enhance their knowledge and capabilities, AI-driven learning initiatives strengthen the competence dimension of psychological empowerment. Employees who receive ongoing developmental support are more likely to adapt successfully to technological changes and remain engaged in their work.

7.4 Digital HR Analytics

Digital HR analytics utilizes AI and data analytics to support evidence-based HR decision-making. Organizations increasingly employ predictive analytics to understand employee behavior, identify turnover risks, measure engagement levels and evaluate workforce performance. Access to data-driven insights enables HR professionals to design targeted interventions that improve employee well-being and organizational effectiveness. Additionally, transparent use of analytics can enhance employee perceptions of fairness and organizational support. When employees receive meaningful feedback and data-informed development opportunities, they experience greater control over their career growth and professional development.

7.5 Ethical Considerations

Despite its advantages, AI-driven HRM raises important ethical concerns related to privacy, transparency, accountability and algorithmic bias. Employees may become skeptical of AI systems if decision-making processes are opaque or perceived as unfair. Organizations must therefore establish ethical AI governance frameworks that ensure responsible use of employee data, explainable algorithms and human oversight in critical HR decisions. Ethical implementation of AI promotes trust, protects employee rights and strengthens psychological empowerment. Consequently, organizations that prioritize fairness, transparency and accountability are more likely to achieve positive employee outcomes while maximizing the benefits of AI-driven HRM practices.

8. ORGANIZATIONAL CULTURE, TRUST AND GOVERNANCE

The successful implementation of Artificial Intelligence (AI) in organizations depends not only on technological capabilities but also on organizational culture, employee trust and effective governance mechanisms. A supportive organizational environment plays a critical role in shaping employee perceptions of AI and determining whether Human-AI collaboration enhances or undermines employee engagement. Trust, transparency, ethical governance, leadership support and psychological safety collectively create the foundation for sustainable and human-centered AI adoption.

8.1 Trust in AI Systems

Trust is a fundamental determinant of employee acceptance and effective utilization of AI technologies.



Employees are more likely to collaborate with AI systems when they perceive them as reliable, accurate, transparent and aligned with organizational values. Trust reduces uncertainty associated with technological change and encourages employees to rely on AI-generated insights in their decision-making processes. Conversely, concerns regarding algorithmic bias, privacy violations and opaque decision-making can undermine employee confidence and hinder AI adoption. Therefore, organizations must actively build trust through transparent communication, employee involvement and consistent demonstration of AI system reliability.

8.2 Explainable AI (XAI)

Explainable Artificial Intelligence (XAI) refers to AI systems that provide understandable explanations for their decisions and recommendations. In organizational settings, employees are more likely to trust and accept AI technologies when they understand how outcomes are generated. XAI enhances transparency by enabling employees to interpret algorithmic logic, evaluate recommendations and identify potential errors or biases. By improving employees' understanding of AI-driven decisions, explainable systems promote confidence, accountability and informed collaboration between humans and intelligent technologies. Consequently, XAI serves as a critical mechanism for strengthening trust and facilitating responsible AI adoption.

8.3 Ethical Governance

Ethical governance is essential for ensuring that AI technologies are deployed responsibly and fairly. Organizations must establish governance frameworks that address issues such as data privacy, algorithmic bias, accountability, transparency and employee rights. Ethical AI governance ensures that AI systems operate in accordance with legal requirements and organizational values while protecting employees from discriminatory or unfair outcomes. Effective governance mechanisms also provide employees with opportunities to question, challenge and seek clarification regarding AI-assisted decisions. Such practices foster trust and reinforce organizational commitment to fairness and responsibility.

8.4 Leadership Support

Leadership plays a pivotal role in shaping employee attitudes toward AI adoption. Leaders who communicate a clear vision for Human-AI collaboration, provide necessary resources and training and address employee concerns contribute significantly to successful technological transformation. Supportive leadership helps employees understand the benefits of AI while reducing fears related to job displacement and uncertainty. Furthermore, leaders who actively promote participation, learning and innovation create conditions that encourage employee engagement and psychological empowerment in AI-driven workplaces.

8.5 Psychological Safety

Psychological safety refers to employees' belief that they can express ideas, ask questions, admit mistakes and voice concerns without fear of negative consequences. In AI-enabled organizations, psychological safety is particularly important because employees must continuously learn, experiment with new technologies and adapt to changing work processes. A psychologically safe environment encourages open communication regarding AI-related challenges and opportunities, fostering trust and collaboration. Employees who feel safe are more likely to engage in learning, innovation and constructive dialogue, thereby enhancing the effectiveness of Human-AI collaboration and supporting sustainable organizational performance.

9. FUTURE RESEARCH DIRECTIONS

The rapid integration of Artificial Intelligence (AI) into organizational environments has created numerous opportunities for future research. Although existing studies have provided valuable insights into Human-AI collaboration and employee engagement, several areas require further investigation to enhance theoretical understanding and practical application.

9.1 Longitudinal Studies

Most current research relies on cross-sectional designs, limiting the ability to establish causal relationships between Human-AI collaboration, psychological empowerment and employee engagement. Future studies should adopt longitudinal approaches to examine how employee perceptions, attitudes and behaviors evolve over time as organizations progress through different stages of AI adoption. Such studies would provide deeper insights into the long-term effects of AI on workplace outcomes.

9.2 Cross-Cultural Comparisons

Cultural values significantly influence employees' acceptance of technology, perceptions of empowerment and engagement levels. Future research should conduct cross-cultural comparisons to explore how Human-AI collaboration functions across different national and organizational cultures. Comparative studies can identify cultural factors that facilitate or hinder successful AI implementation and employee adaptation.

9.3 Industry-Specific Investigations

The impact of AI varies considerably across industries due to differences in job characteristics, technological intensity and workforce requirements. Future studies should examine Human-AI collaboration within specific sectors such as healthcare, education, manufacturing, finance and information technology to identify industry-specific opportunities and challenges affecting employee engagement and empowerment.

9.4 Generational Differences

Employees from different generations may perceive and interact with AI technologies differently. Future research should investigate how generational cohorts such as Generation Z, Millennials, Generation X and Baby Boomers differ in terms of



AI acceptance, trust, digital competence and engagement. Such findings can assist organizations in designing tailored AI adoption and workforce development strategies.

9.5 AI Governance and Employee Well-being

Future research should further explore the relationship between AI governance mechanisms and employee well-being. Studies examining ethical AI practices, algorithmic transparency, privacy protection and responsible AI use can provide valuable insights into how governance frameworks influence trust, psychological empowerment, job satisfaction and long-term employee well-being in AI-driven workplaces.

10. THEORETICAL CONTRIBUTIONS

This study makes several important theoretical contributions to the emerging literature on Human–AI Collaboration and Employee Engagement. First, it extends **Psychological Empowerment Theory** to AI-driven workplaces by explaining how Human–AI Collaboration enhances employees’ perceptions of meaning, competence, self-determination and impact. Second, it enriches the **Job Demands–Resources (JD-R) Theory** by conceptualizing Human–AI Collaboration as both a valuable job resource and a potential job demand. Third, the study integrates perspectives from **Human Resource Management, Organizational Behavior, Psychology and Artificial Intelligence** into a unified conceptual framework. Fourth, it identifies **Psychological Empowerment as a key mediating mechanism** linking Human–AI Collaboration and Employee Engagement, addressing a significant gap in existing research. Finally, the study advances the **Human-Centered AI** perspective by emphasizing the roles of trust, transparency and

ethical governance in fostering sustainable employee engagement and organizational effectiveness. The proposed framework provides a foundation for future empirical research examining employee experiences and behavioral outcomes in AI-enabled workplaces.

11. PRACTICAL IMPLICATIONS

The findings of this study offer important practical implications for organizations seeking to successfully integrate Artificial Intelligence (AI) into workplace processes. As Human–AI Collaboration becomes increasingly prevalent, organizations must adopt a **human-centered approach** that balances technological innovation with employee well-being and engagement. HR managers should focus on AI literacy, continuous learning and empowerment-oriented practices that enhance employee competence, autonomy and adaptability. Organizational leaders should promote transparency, trust and employee participation in AI implementation to reduce resistance and strengthen commitment. AI system designers must develop explainable, ethical and user-friendly technologies that complement human capabilities rather than replace them. Policymakers and governance bodies should establish frameworks ensuring fairness, accountability, privacy protection and responsible AI use. By fostering psychological empowerment, trust and ethical governance, organizations can maximize the benefits of Human–AI Collaboration while enhancing employee engagement, organizational effectiveness and sustainable performance.

Table 3. Managerial Implications of Human–AI Collaboration

Stakeholder	Key Managerial Focus	Recommended Actions	Expected Outcomes
HR Managers	Employee capability development and AI readiness	Conduct AI literacy programs, digital skill training, continuous learning initiatives, and empowerment-oriented HR practices.	Enhanced competence, adaptability, employee engagement, and workforce resilience.
Organizational Leaders	Strategic AI adoption and change management	Communicate a clear AI vision, involve employees in AI implementation, provide support during transitions, and foster innovation.	Higher employee trust, reduced resistance to change, and stronger organizational commitment.
Employees	Effective Human–AI collaboration	Engage in continuous upskilling, participate in AI-driven learning opportunities, and leverage AI tools for decision-making and productivity.	Increased confidence, autonomy, job satisfaction, and career growth.
AI System Designers	Human-centered AI development	Design transparent, explainable, user-friendly, and ethical AI systems that complement human capabilities rather than replace them.	Greater AI acceptance, trust, usability, and collaborative efficiency.
Policy Makers	Responsible AI governance	Develop policies promoting algorithmic transparency, data privacy, fairness, accountability, and workforce reskilling programs.	Sustainable AI adoption, employee protection, and ethical workplace practices.



Top Management	Organizational culture and digital transformation	Create a culture of trust, psychological safety, innovation, and collaboration between humans and AI systems.	Improved employee engagement, organizational effectiveness, and long-term competitiveness.
Technology & IT Departments	AI implementation and support infrastructure	Ensure reliable AI systems, provide technical support, monitor AI performance, and maintain cybersecurity standards.	Smooth AI integration, reduced technological anxiety, and improved operational efficiency.
Governance & Compliance Teams	Ethical oversight and risk management	Establish AI ethics committees, audit AI decisions regularly, and ensure compliance with legal and ethical standards.	Increased employee confidence, reduced AI-related risks, and stronger organizational credibility.

Key Managerial Takeaways

1. Human-AI Collaboration should augment rather than replace employees.
2. Psychological Empowerment (Meaning, Competence, Self-Determination, and Impact) must be actively nurtured through AI implementation strategies.
3. Trust, transparency, and ethical governance are critical success factors for AI adoption.
4. Continuous learning and reskilling initiatives are essential for sustaining employee engagement in AI-driven workplaces.
5. Organizations that adopt a Human-Centered AI approach are more likely to achieve higher employee engagement, innovation, and sustainable organizational performance.

12. LIMITATIONS OF THE STUDY

Despite its contributions, this study has certain limitations:

- The study is based solely on a **Systematic Literature Review (SLR)** and does not provide empirical validation of the proposed conceptual framework.
- Only **peer-reviewed English-language articles** published between 2022 and 2025 were included, which may limit the generalizability of the findings.
- The rapidly evolving nature of **Artificial Intelligence technologies** may lead to new developments that are not captured in the current review.
- The study primarily focuses on **Psychological Empowerment** as a mediating variable, while other psychological and organizational factors may also influence employee engagement.
- The review relies on secondary data, making the findings dependent on the scope and quality of existing literature.

13. CONCLUSION

The rapid integration of **Artificial Intelligence (AI)** into organizational processes has fundamentally transformed the nature of work and created new opportunities for **Human-AI Collaboration**. This study highlights that effective collaboration between employees and AI systems can significantly enhance **Employee Engagement** by improving productivity, facilitating learning, supporting decision-making and enabling employees to focus on meaningful and value-adding activities. However, the positive outcomes of AI adoption are not automatic and depend

largely on employees' psychological experiences within AI-driven work environments.

The study identifies **Psychological Empowerment** as the central mediating mechanism linking Human-AI Collaboration and Employee Engagement. The four dimensions of empowerment—**Meaning, Competence, Self-Determination and Impact**—play a crucial role in shaping employee motivation, commitment and workplace involvement. Employees who perceive their work as meaningful, feel competent in using AI technologies, experience autonomy and recognize their contribution to organizational success are more likely to remain engaged and productive.

Furthermore, the findings emphasize the importance of **Trust, Transparency** and **Ethical Governance** in fostering successful Human-AI interactions. Organizations must ensure explainable AI systems, fair decision-making processes, data privacy protection and responsible AI governance to build employee confidence and acceptance. Supportive leadership and a culture of psychological safety further strengthen these outcomes.

Overall, **Human-Centered AI Adoption** emerges as a strategic approach that balances technological innovation with employee well-being. By prioritizing empowerment, trust and ethical implementation, organizations can enhance **Employee Engagement**, improve **Organizational Performance** and achieve sustainable success in the evolving digital workplace. The study therefore provides a foundation for future empirical investigations and offers a roadmap for organizations seeking to create sustainable, human-centered AI ecosystems.

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