

Enhancing Technology Acceptance in Socio-Technical Systems: A Human-Centred Approach to AI Implementation

Carolin Böhme¹ and Claudia Graf-Pfohl²

¹Technische Universität Dresden, S 01062, Germany

²ATB Arbeit, Technik und Bildung gGmbH, Chemnitz, S 09119, Germany

ABSTRACT

Challenges in integrating AI into operational socio-technical systems due to human factors, workflows, and needs. Human-centred implementation is critical to overcoming resistance and ensuring successful adoption. Enhancing technology acceptance in AI systems within socio-technical frameworks by emphasizing Human-Centred Design (HCD). Three levels of human inclusion are critical—technology, organization, and mutual participation—each requiring specific methods and approaches for effective AI implementation. Translating academic research into practical, business-oriented applications while aligning with sustainability goals is essential. Adaptation to practical cases is necessary. A human-centred approach is crucial for technology acceptance, and this approach should be tailored to the context of the socio-technical system.

Keywords: AI integration in SMES, Human-centred design (HCD), Technology acceptance, Organizational change, Agile methods, Participatory design, Sustainability in AI, Human-AI collaboration, Leadership in AI adoption, Employee involvement, Mutual participation

INTRODUCTION

In the era of rapidly advancing artificial intelligence (AI), ensuring the smooth and effective integration of AI technologies into socio-technical systems is a pressing concern for organizations. This paper, prepared for the IHSI 2025 conference, explores human-centred approaches to AI implementation, emphasizing the necessity of aligning technology with organizational and human needs. Drawing from Böhme, Graf-Pfohl, and Meusinger's work *Human-Centered Implementation Process of AI – Conditions for Success* (2023), and further studies such as Herrmann & Pfeiffer (2023), this paper underscores how socio-technical perspectives offer frameworks to ensure the effective adoption of AI while maintaining ethical integrity, usability, and organizational adaptability.

Through a focus on **Human-Centred Design (HCD)**, participatory methodologies, and agile organizational leadership, this paper demonstrates the importance of a balanced approach in implementing AI within socio-technical systems. It also emphasizes the iterative development and feedback

loops essential for preventing errors and fostering technology acceptance over time. This human-centred framework aligns with the overarching aim of ensuring a smooth, sustainable, and successful transition to AI-supported workflows.

Technology Level: Aligning AI With Operational Challenges

The effective implementation of AI must begin at the technology level, ensuring that AI solutions address real operational challenges rather than hypothetical or irrelevant issues. As highlighted by Böhme et al., the design and development of AI must focus on resolving concrete operational pain points, with **Key Performance Indicators (KPIs)** such as **efficiency, user satisfaction, and trustworthiness** guiding the process. **Human-Centred Design (HCD)** principles (ISO 9241-220; Maguire, 2001) underscore the importance of early and continuous user involvement in shaping technology that meets practical needs.

The **acatech case study** by Schuh et al. (2020) offers practical insights into ensuring AI's relevance, advocating for early **skills development** and task-oriented competence management. By tailoring training programs to the specific roles that AI affects, organizations can facilitate smoother transitions into AI-supported workflows (André et al., 2021). This early involvement of stakeholders—employees, management, and domain experts—ensures that role profiles and competence requirements align with real-world needs.

Focus: Addressing Real Challenges

AI systems must solve actual operational challenges to achieve long-term acceptance. According to Norman & Draper (1986), AI technologies should meet real-world pain points rather than theoretical problems.

Method: Human-Centered Design

Incorporating **Participatory Design (PD)** principles enables user engagement from the earliest stages of development. This approach ensures that technology meets practical, user-centered requirements, promoting sustained use and acceptance.

Outcome: Sustainable Integration

A successful AI integration process is one that prioritizes **continuous user feedback**, promoting technologies that respond to evolving user needs. Early involvement and continuous learning help organizations reduce resistance and foster long-term acceptance.

Organizational Level: Leadership and Agility in AI Adoption

AI adoption must be seen as both a technological and organizational challenge. Leadership and organizational agility are essential for managing the complexities of integrating AI into existing workflows. Böhme et al. emphasize the role of leadership in fostering a culture of innovation while addressing resistance to technological change. Agile methodologies, such as

those discussed by Kotter (1996), enable organizations to adapt to rapidly evolving technological landscapes.

The role of leadership is crucial in guiding organizations through AI transitions. Leaders must prioritize open communication, actively engage employees, and model a positive attitude towards AI adoption. **Participatory governance** (Zuh et al., 2018) ensures that employees are involved in decision-making processes, fostering a sense of ownership and reducing fear of change.

Focus: Leadership and Organizational Agility

Organizational agility, **supported by strong leadership**, enables a flexible response to the challenges posed by AI implementation (Hacker, 2022; Graf-Pfohl, 2022). Leaders must champion the AI transition process, creating a collaborative environment that fosters innovation.

Method: Training and Participatory Governance

Training programs that prepare both leaders and employees for AI adoption reduce resistance and create a culture of collaboration (Chiu, 2021). Participatory governance models that **involve employees in the decision-making process** are critical for fostering trust and ownership of AI projects.

Outcome: A Prepared Workforce

A workforce that is both well-trained and actively involved in the AI integration process is more likely to accept and successfully implement AI systems. This involvement also promotes **long-term use of AI**, ensuring alignment with organizational goals and values (Vyhmeister et al., 2023).

Staff Level: Participatory Design and Mutual Participation

At the staff level, ensuring mutual participation of leaders and employees is key to fostering trust in AI systems. Böhme et al. emphasize the need for cross-departmental collaboration, engaging both employees and executives in the development process. A participatory approach to AI design, involving active feedback loops, reduces user apprehension and increases long-term acceptance.

Fronczek et al. (2024) reinforce this idea by highlighting the importance of skills development in AI adoption, particularly at early stages. By equipping users with the necessary knowledge and understanding, organizations can reduce latent fears and increase the likelihood of AI systems being embraced. Participation in **co-creation** (Ramaswamy & Ozcan, 2014) ensures that technology serves as a collaborative tool, enhancing **human-AI partnerships** rather than replacing human input.

Focus: Co-Development and Ethical Concerns

Ensuring that AI systems align with both human and organizational needs is crucial to **minimizing fears** and encouraging participation (Brynjolfsson & McAfee, 2014).

Method: Democratization of AI

AI systems should serve as collaborative tools, **augmenting human work** rather than replacing it. **Participatory design** and **co-creation** enable users to actively contribute to the design process, ensuring that technology aligns with broader organizational goals.

Outcome: Long-Term AI Acceptance

By creating a sense of **shared responsibility**, participatory approaches enhance the acceptance of AI systems, encouraging users to engage with and integrate AI technologies into everyday workflows (Kerzel et al., 2021).

Outlook: Future Directions and Development Needs

The implementation of AI systems within socio-technical frameworks is an ongoing process, requiring further research and refinement. As organizations continue to integrate AI into their operations, several key areas deserve attention:

1. **Customizing KPIs for AI Adoption:** Organizations need to develop **human-centered KPIs** that measure not only efficiency but also **trust, user satisfaction, and ease of use**. These metrics must be adapted to the unique needs of different industries and organizational structures.
2. **Cross-Disciplinary Collaboration:** Future research should explore how technical and non-technical experts can collaborate effectively during the AI implementation process. By involving diverse stakeholders, organizations can alleviate concerns and create more robust frameworks for success.
3. **Mitigating Change Fatigue:** As AI adoption progresses, it is important to address **change fatigue** through phased AI integration and iterative workshop sessions. Gradual AI transitions can minimize disruptions and create smoother but sustainable adoption processes (André et al., 2021).
4. **Supporting SMEs in AI Adoption:** Small and medium-sized enterprises (SMEs) face unique challenges in AI adoption. Future studies should focus on creating scalable, adaptable and iterative frameworks that cater to the limited resources and specific needs of SMEs (OECD, 2021).

CONCLUSION

In conclusion, the successful integration of AI within socio-technical systems relies on a human-centred, participatory approach. By focusing on real operational challenges, promoting organizational agility, and fostering cross-departmental collaboration, organizations can enhance technology acceptance and ensure sustainable AI integration. Iterative development processes, supported by continuous feedback loops and task-oriented competence management, help prevent errors and minimize resistance.

As this paper demonstrates, aligning AI implementation with human and organizational needs is key to fostering long-term success. Organizations that prioritize participatory governance, agile leadership, and continuous skills development can achieve a balanced and ethical approach to AI adoption.

Future research should continue to refine these frameworks, ensuring that AI serves not only as a technological innovation but as a tool that enhances both human and organizational capabilities. For future developments, the organisation gains additional expertise through human-centred project management.

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