

The Role of Artificial Intelligence in Automation

Problem Statement: Bridging the Gap Between AI Capabilities and Effective Automation

Artificial Intelligence has become an important technology driving global automation because companies use it to simplify tasks and reduce costs across areas like human resources and warehouses and education (Ekuma, 2024; Sodiya et al., 2024). However, a big problem remains because even though AI technology has improved very fast, many companies still struggle to use it well. This gap leads to disconnected systems and low user trust because the technology does not match the people or their work environments.

Regarding these operational challenges, Fügener et al. (2026) found that automation works best when tasks are clearly divided between humans and AI while AI augmentation is more effective when both work together. Without this clear operational design, AI can disrupt workflows, increase job polarization, and create resistance from employees (Tyson & Zysman, 2022). In addition, using AI quickly without proper governance can lead to ethical and social problems that organizations are not ready to manage (Khogali & Mekid, 2023). Although some studies suggest solutions for specific areas such as reducing teachers administrative work (Williamson et al., 2023) and improving logistics with computer vision (Sodiya et al., 2024), they do not fully address the wider challenge of managing AI effectively in organizations.

This creates an important research gap Most existing studies focus on the technical capabilities of AI instead of providing a practical framework for using AI effectively in real organizations As a result many organizations do not have clear guidance on how to use AI to improve efficiency while maintaining ethical standards and supporting collaboration between humans and AI Without addressing this gap organizations may achieve lower returns from digital transformation face more operational challenges and struggle to adapt their automated systems over time. Therefore, more research is needed to examine the overall role of AI in automation and develop practical sustainable and ethical implementation models that can improve automation across different industries

Research Objectives

Main objective:

To study how artificial intelligence can contribute to effective automation across industries while addressing the operational ethical and practical challenges that create a gap between AI capabilities and real world implementation.

Sub-objectives:

1. To analyze the current role of artificial intelligence in driving automation to simplify tasks and reduce costs across different sectors.
2. To identify the most prominent operational challenges associated with AI adoption including workflow disruption of job polarization and employee resistance.
3. To examine the ethical and governance issues related to rapid AI implementation and how organizations manage these social risks.
4. To explore how balancing task division and human-AI collaboration affect the overall effectiveness of automated systems.
5. To investigate practical and sustainable implementation models that can provide clear guidance for organizations to use AI effectively in the future.

Literature Review;

Artificial Intelligence (AI) serves as a main technology driving global automation because it helps companies increase productivity and reduce manual tasks and make better decisions. Today AI tools are growing fast across business and education and logistics and human resources. However, achieving success with AI requires companies to find a good balance between machine automation and human work while handling different organizational and ethical problems.

AI and Human Collaboration

Fügener et al. (2026) showed that AI helps automation in two distinct ways because automation works best when tasks are cleanly split between humans and AI. On the other hand, augmentation works better when humans and machines collaborate on the same task. Their study suggests that companies must carefully choose which specific tasks to automate and which tasks need teamwork.

AI and the Future of Work

Tyson and Zysman (2022) looked at how AI impacts jobs and the labor market because AI increases productivity while changing what companies need from workers. They expressed serious concerns about job polarization and flat wages and emphasized that governments need new policies to help workers adapt to these fast technologies.

AI in Warehouse Automation

Sodiya et al. (2024) investigated AI use in warehouse automation and found that machine learning and computer vision and robots improve efficiency by fixing logistics delays. However, the authors explained that high setup costs and infrastructure challenges still need more solutions before full adoption.

AI in Education

Williamson et al. (2023) studied AI in education and found that it successfully reduces administrative work for teachers. However, they warned that depending too much on AI can make learning processes too simple and lower the actual quality of education.

Implications for Future Research

The current literature shows that AI improves automation across many fields but also brings challenges in ethics and costs and human collaboration. Most past studies look only at single industries or specific tools which create a big gap in understanding the general role of AI. Therefore, future research must create a wider framework that connects technical and ethical sides to support successful AI adoption across all industries.

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