

Leadership Dynamics in Human-in-the-Loop Security Models for General-Purpose AI Systems: Implications for Workforce and Technological Transformation

Dr. Ananya Rajagopalq, Dr. José Anselmo Pérez Reyes

Universidad Anáhuac México

Abstract

The rapid diffusion of artificial intelligence as a general-purpose technology is fundamentally reshaping organizational structures, leadership roles, and workforce capabilities. Despite growing interest in AI-driven transformation, limited research integrates human-centered design perspectives with strategic capability development to explain how organizations adapt to Human–AI collaboration. This study addresses the gap by reviewing and conceptually integrating Sociotechnical Systems Theory and Dynamic Capabilities Theory to examine the role of Human-in-the-Loop mechanisms in organizational transformation. Data has been collected using structured pre-coded research instrument from 15 senior executives (5 senior executives from each industry) and 148 mid-level employees during April 2025 – September 2025. This study contributes to the existing literature by analyzing the effectiveness of human-in-the-loop security models in the organizations in the context of leadership skills, employee engagement, and ethical challenges in implementing AI tools within day-to-day activities. Organizations may need to entrench HITL practices into leadership development programs, and performance evaluation.

Keywords: Gaps in skill development, Human-in-the-loop model, leadership, workforce transformation, and Human-AI intervention