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Effects of Artificial Intelligence in the Midst of Technological Advancements

Lakshmana M
Head, Department of Business Administration
St. Joseph's First Grade College, Jayalakshmipuram
Mysuru-570012

Abstract

Artificial Intelligence (AI) is rapidly transforming economic, social and governance systems across the world. While AI adoption grows exponentially, academic evidence on its long-term, sector-specific, and socio-economic effects remains fragmented. This paper examines the impacts of AI in the current technological era and highlights key research gaps, including the lack of longitudinal studies, weak causal methods, inadequate sector-wise data, absence of standardized impact metrics, and limited evidence from the Global South. Using a qualitative review-based methodology, the study synthesizes the current state of knowledge and discusses implications for labour markets, inequality, governance, and ethics. The findings show that although AI enhances productivity, efficiency, and decision-making accuracy, long-term societal consequences and regulatory effectiveness remain poorly understood. The paper concludes with recommendations for future research aimed at building a more holistic and evidence-driven understanding of AI's role in society.

Keywords

Artificial Intelligence, Technological Advancements, Labour Market, Inequality, Governance, Global South, Research Gaps, Automation

Introduction

Artificial Intelligence has emerged as a central pillar of modern technological development, influencing industries, governance systems, and everyday life. From machine learning applications in healthcare and finance to generative AI tools transforming creative and educational sectors, AI is reshaping how societies function.

However, despite rapid integration, academic research often lacks depth in analyzing AI's long-term consequences. Most studies emphasize short-term productivity gains and technological benefits, but fewer investigate structural changes in labour markets, social equity, governance effectiveness, or global disparities.

Moreover, the dominance of high-income countries in AI research creates an incomplete global understanding of its broader socio-economic impact. In addition, the absence of standardized impact metrics

and restricted access to proprietary AI datasets pose methodological challenges that limit reproducibility and policy relevance.

This research explores the evolving effects of AI amid on-going technological advancements while foregrounding the major unresolved gaps in existing literature.

Literature Review

AI and Economic Transformation

Studies highlight AI's capacity to enhance productivity, automate complex tasks, and support data-driven decision-making (Brynjolfsson & McAfee, 2017; Susskind, 2020). Automation has been shown to replace routine labour while augmenting high-skilled work (Acemoglu & Restrepo, 2020). However, these studies emphasize short-term effects, offering limited evidence on long-term wage shifts or structural labour-market changes.

Labour Market Disruption and Inequality

Research by Autor (2019) suggests that AI-driven automation may deepen job polarization, with mid-skill roles becoming vulnerable. While some studies predict net productivity gains, empirical evidence on wage inequality and job displacement remains mixed (Frank et al., 2019). A recurring issue is the absence of longitudinal and causal studies that measure AI's effects over extended periods.

Sector-Wise and Task-Level Variations

Existing literature acknowledges that AI impacts differ across industries—finance, IT, and healthcare show rapid AI integration, while agriculture and public administration lag behind (Makridakis, 2017). Yet, few studies provide detailed sectoral comparisons or task-level analyses, reflecting a significant gap in understanding differentiated effects.

AI Governance, Bias, and Ethics

Ethical concerns such as algorithmic bias, privacy, fairness, and transparency are widely discussed (O'Neil, 2016; Floridi et al., 2018). However, most literature is conceptual rather than empirical. Research evaluating the real-world effectiveness of governance frameworks, ethical guidelines, or AI regulations remains highly limited.

Technological Advancements and Global South Evidence

The majority of AI impact studies originate from the US, Europe, and East Asia. Scholars argue that developing countries face unique challenges involving informal labour markets, limited digital infrastructure, and regulatory gaps (Avgerou, 2019). Yet, empirical studies from Africa, South Asia, and Latin America are scarce, contributing to a skewed global evidence base.

Measurement and Methodological Limitations

Another challenge lies in the absence of standardized metrics to evaluate AI's societal or economic impact. Researchers employ inconsistent variables, limiting comparability across studies (Jobin, Ienca & Vayena, 2019). Moreover, restricted access to proprietary AI datasets restricts reproducibility and independent validation.

Summary of Literature Gap

The review reveals consistent gaps
– lack of longitudinal studies
– scarcity of causal evidence
– weak sector-wise differentiation
– limited Global South representation
– no universally accepted AI impact metrics
– insufficient analysis of inequality and wage structures
– minimal real-world evaluations of AI governance
– poor reproducibility due to proprietary restrictions

Research Methodology

This study adopts a qualitative, descriptive research design using secondary data. Academic journal articles, global AI reports, and policy documents were analyzed to synthesize findings on AI's effects. A thematic approach was used to categorize AI impacts across economic, social, and governance dimensions.

Gap analysis was applied to identify areas where empirical evidence is lacking. Because the study relies on secondary literature, it acknowledges limitations related to source availability, evolving AI technologies, and limited longitudinal data.

Results

1. AI Productivity and Efficiency Gains

AI has led to substantial improvements in automation, data analytics, and operational efficiency across multiple industries. Decision-making accuracy has improved in finance, healthcare diagnostics, logistics, and customer-service sectors.

2. Uncertain Labour-Market Outcomes

While AI creates new job categories and enhances high-skill roles, evidence on long-term impacts on wages, job displacement, and inequality remains inconclusive. Most findings rely on short-term or descriptive analyses.

3. Uneven Sectoral and Regional Impacts

AI's effects vary widely across sectors, with high-tech industries benefiting most. Developing countries show slower adoption and weaker regulatory mechanisms, contributing to widening global disparities.

4. Ethical and Governance Challenges

Algorithmic bias, fairness issues, and transparency concerns persist. Limited empirical studies evaluate the effectiveness of current AI governance frameworks.

5. Persistent Research Gaps

All major research gaps identified remain largely unresolved:
– methodological limitations;
– absence of standardized metrics;

– limited cross-country comparisons;
– insufficient causal evidence.

Discussion

The study highlights that AI is transforming societies, yet understanding of its long-term implications remains incomplete.
Productivity gains are well-documented, but socio-economic outcomes—such as inequality, labour-market restructuring, and global digital divides—require stronger empirical analysis.
Without standardized metrics or access to proprietary datasets, research cannot reliably track AI impacts over time. Moreover, the absence of Global South studies creates a biased global narrative where policy recommendations may lack relevance for developing nations.

Ethical and governance challenges continue to grow as AI systems become more embedded in public decision-making. However, scholarly work remains largely conceptual, leaving a gap in practical, field-based evaluations of regulatory effectiveness.

This highlights the urgent need for more rigorous, multidisciplinary, and globally inclusive research.

Conclusion

AI is fundamentally reshaping economic, social, and governance systems in the midst of rapid technological advancements. While its benefits are widely acknowledged, substantial uncertainty persists due to methodological, geographical, and data-related research gaps.

This paper underscores the need for longitudinal studies, causal identification methods, sector-specific research frameworks, global participation in dataset generation, and empirically validated governance models. Strengthening these areas will support more equitable, responsible, and evidence-driven AI development.

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