

Role of Artificial Intelligence in Advancing Women's Empowerment: Opportunities and Challenges

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Introduction:

Artificial intelligence (AI) has proven to be a transformative force in today's world, reshaping industries, altering labor markets, and opening unprecedented opportunities across diverse sectors. AI systems can process substantial amounts of data, identify patterns, and make informed predictions, creating efficiencies in healthcare, education, and business operations². For women, who face systemic barriers across these sectors, AI has the potential to be a powerful tool for empowerment and greater inclusivity. As AI technology advances, understanding its role in supporting women's empowerment becomes crucial to building a more equitable future.



Source: atclanguageschools.com

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² Lainjo, Bongs. 2024. 'The Role of Artificial Intelligence in Achieving the United Nations Sustainable Development Goals'. *Journal of Sustainable Development* 17 (5): p30. doi:[10.5539/jsd.v17n5p30](https://doi.org/10.5539/jsd.v17n5p30).

Women's empowerment involves enhancing women's rights, agencies, and access to resources, which are essential for economic development and social stability. Empowering women across education, healthcare, and the workforce has been shown to foster progress in communities, increasing economic productivity and improving outcomes in public health and child welfare³. However, globally, women continue to experience significant disparities in opportunities, resources, and representation, especially in traditionally male-dominated fields like technology and science. AI can help address these disparities by providing innovative solutions that enhance women's access to resources and opportunities⁴.

AI-driven platforms can bring quality educational resources to remote areas, improving access for girls and women in regions where educational opportunities are limited. Educational Platforms utilize AI to personalize learning experiences, adapting content to the learner's pace and skill level, which can be particularly beneficial for women balancing work and family responsibilities⁵. In healthcare, AI applications help tailor medical solutions for women by analyzing vast datasets to identify health trends, thereby addressing gender-specific health concerns such as maternal health or breast cancer with more precision⁶.

AI can also reduce gender bias in hiring and promotions by analyzing recruitment processes and providing insights into discriminatory practices. For example, Textio, an AI-driven platform, assists companies in removing gender-biased language from job descriptions, helping to attract a more diverse applicant pool. This approach aids organizations in promoting equal opportunities,

³ Women, UN. 2018. 'Turning Promises into Action: Gender Equality in the 2030 Agenda for Sustainable Development'. Assessment ISBN: 978-1-63214-108-8. UN Women Headquarters Office. <https://www.unwomen.org/en/digital-library/publications/2018/2/gender-equality-in-the-2030-agenda-for-sustainable-development-2018>.

⁴ Babashahi, Leili, Carlos Eduardo Barbosa, Yuri Lima, Alan Lyra, Herbert Salazar, Matheus Argôlo, Marcos Antonio De Almeida, and Jano Moreira De Souza. 2024. 'AI in the Workplace: A Systematic Review of Skill Transformation in the Industry'. *Administrative Sciences* 14 (6): 127. doi:[10.3390/admsci14060127](https://doi.org/10.3390/admsci14060127).

⁵ UNESCO. 2020. 'Women's Access to and Participation in Technological Developments | UNESCO'. <https://www.unesco.org/en/artificial-intelligence/gender-equality>.

⁶ Alowais, Shuroug A., Sahar S. Alghamdi, Nada Alsuhebany, Tariq Alqahtani, Abdulrahman I. Alshaya, Sumaya N. Almohareb, Atheer Aldairem, et al. 2023. 'Revolutionizing Healthcare: The Role of Artificial Intelligence in Clinical Practice'. *BMC Medical Education* 23 (September): 689. doi:[10.1186/s12909-023-04698-z](https://doi.org/10.1186/s12909-023-04698-z).

contributing to more inclusive workplaces⁷. While AI holds substantial potential for advancing women's empowerment, the technology must be carefully designed to avoid perpetuating existing biases. With ethical use, inclusive data practices, and active engagement from women in AI development, AI can serve as a critical tool for closing gender gaps and promoting women's empowerment.

Opportunities AI Provides for Women's Empowerment:

AI has opened new pathways for empowering women across financial, safety, and educational domains by providing targeted tools and resources to address longstanding challenges. In the realm of financial empowerment, AI-driven tools are now providing personalized financial coaching to women, helping to overcome barriers to financial literacy that have historically hindered economic participation. For instance, AI applications can analyze spending habits, offer tailored budgeting advice, and simplify complex financial concepts, giving women more control over their financial health. Additionally, AI can address systemic biases in financial services by identifying and correcting gender biases in credit assessments and loan approvals, thus promoting fairer access to resources⁸.



Source: onlinemarketinginct.com

⁷ Niimi, Yoko. 2009. 'ADB Economics Working Paper Series', 186, , December.

⁸ Adelaja, Adesola Oluwatosin, Bibitayo Ebunlomo Abikoye, Michelle Chibogu Neziyanya, Olamide Raimat Amosu, and Oluwatoyin Funmilayo Ayodele. 2024. 'Harnessing AI for Personalized Financial Coaching: A Pathway to Financial Inclusion and Empowerment for Women in the United States'. *World Journal of Advanced Research and Reviews* 23 (2). World Journal of Advanced Research and Reviews: 1356–67. doi:[10.30574/wjarr.2024.23.2.2491](https://doi.org/10.30574/wjarr.2024.23.2.2491).

In terms of safety and security, AI is being leveraged to develop predictive safety mechanisms that can detect and anticipate threats, enhancing women's security with real-time monitoring and alert systems. These tools, like wearable safety devices or mobile apps, provide women with timely warnings and a sense of safety in public and private spaces⁹. Moreover, AI-based community platforms empower women to report safety concerns, contributing to data-driven safety initiatives that help inform policies and develop safer environments¹⁰. This community-driven data collection not only fosters a safer society but also amplifies women's voices in public safety discussions.

In the area of digital literacy and skills, AI is instrumental in making digital tools and resources accessible, which is essential for women's active participation in the digital economy. AI-based educational tools enable women to develop digital skills and build confidence in navigating online spaces, thereby opening new opportunities in various sectors. For example, AI-powered learning platforms offer courses in digital literacy, coding, and entrepreneurship, which are critical for success in today's economy¹¹.

Despite these advancements, challenges remain in Algorithmic bias in AI systems are unaddressed mostly, which can reinforce gender stereotypes, and unequal access to technology can limit the reach of these empowering tools¹². It is essential to develop inclusive AI policies and address digital divides to ensure that AI's transformative potential for women's empowerment is accessible

⁹ Pimpalkar, Amit Purushottam, Nisha Ramesh Wankhade, Vikrant Chole, Yogesh Golhar, Amit Purushottam Pimpalkar, Nisha Ramesh Wankhade, Vikrant Chole, and Yogesh Golhar. 2024. 'Women's Empowerment Through AI: Discovering Data Analytics for Predictive Safety Solutions and Future Trends'. In , 304–26. IGI Global Scientific Publishing. <https://www.igi-global.com/gateway/chapter/www.igi-global.com/gateway/chapter/337770>.

¹⁰ Gandhi, Prasanna Lakshmi, Pushpalata Aher A. Aher, Sneha Chowdhary, Prasanna Lakshmi Gandhi, Pushpalata Aher A. Aher, and Sneha Chowdhary. 2024. 'Women's Safety and Empowerment Using AI Tools'. In *Wearable Devices, Surveillance Systems, and AI for Women's Wellbeing*, 2024th ed., 13. IGI Global Scientific Publishing. <https://www.igi-global.com/gateway/chapter/www.igi-global.com/gateway/chapter/343079>.

¹¹ Shahbazi, Hafizullah, Musawer Hakimi, Helena Ulusi, Behnaz Rahimi, and Tamanna Quraishi. 2024. 'Exploring the Impact of Artificial Intelligence on Women's Empowerment: A Comprehensive Survey'. *EDUTREND: Journal of Emerging Issues and Trends in Education* 1 (2): 108–20. doi:[10.59110/edutrend.333](https://doi.org/10.59110/edutrend.333).

¹² Yunus, Asma, Shahzad Khaver Mushtaq, and Ruqia Safdar Bajwa. "Impact of AI on Diversity and Inclusion." In *Exploring Youth Studies in the Age of AI*, edited by Zeinab Zaremohzzabieh, Rusli Abdullah, and Seyedali Ahrari, 315-335. Hershey, PA: IGI Global, 2024. <https://doi.org/10.4018/979-8-3693-3350-1.ch018>

to all women, regardless of their socio-economic backgrounds. By addressing these challenges, AI can become a powerful catalyst for gender equality and social progress.

Challenges and Ethical Concerns in AI for Women's Empowerment:

The integration of AI in various fields holds significant promise for advancing equity, efficiency, and innovation; however, these advancements also come with inherent challenges, particularly for women. AI systems, though powerful, often perpetuate biases due to underlying issues in training data and algorithm design. Additionally, the widespread use of digital health systems and surveillance technology raises privacy concerns, especially for women, while the digital divide continues to limit their access to AI resources. Examining these barriers is essential for understanding how AI can both positively and negatively impact women's opportunities and rights in society.

1. Bias in AI Algorithms

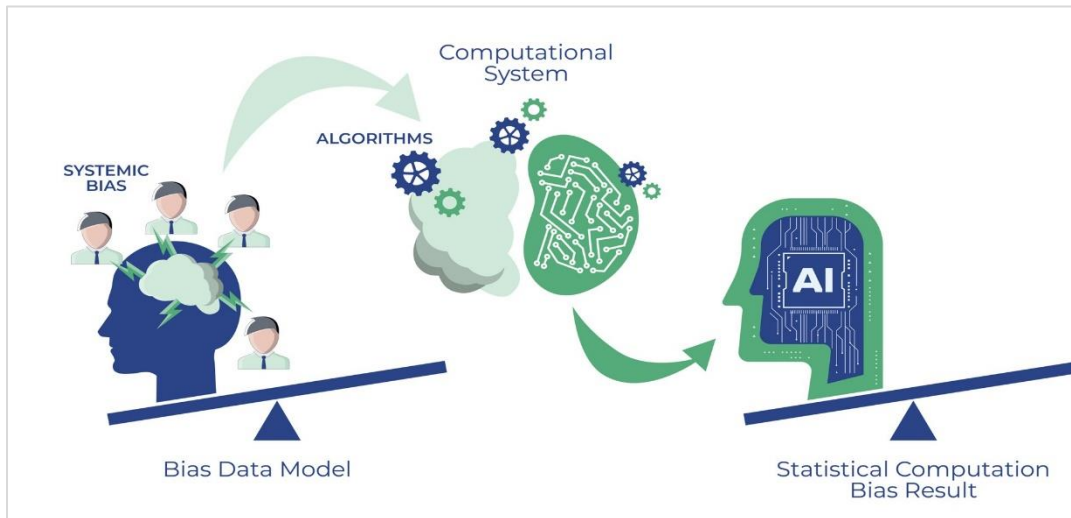
AI algorithms have the potential to perpetuate gender stereotypes and biases, stemming from biased training data that mirrors existing societal inequalities. This is particularly evident in AI-driven hiring tools, where algorithms can systematically favor male candidates, thereby contributing to ongoing discrimination against women in the workplace. Understanding the mechanisms behind these biases is critical to addressing the issue effectively.

Mechanisms of Bias in AI reveal how biases are often embedded in AI systems. One major factor is biased training data; AI models learn from historical data, which frequently reflects gender biases prevalent in society. For instance, if hiring data primarily consists of male candidates, the AI may unintentionally favor similar profiles in future recruitment processes, leading to a cycle of discrimination¹³. Additionally, the algorithmic design itself can embed biases, mirroring patriarchal structures and societal norms. This unintentional bias can skew the decision-making processes that affect hiring and promotion within organizations¹⁴.

¹³ Liu, Yuhan. 2024. 'Unveiling Bias in Artificial Intelligence: Exploring Causes and Strategies for Mitigation'. *Applied and Computational Engineering* 76 (July): 124–33. doi:[10.54254/2755-2721/76/20240576](https://doi.org/10.54254/2755-2721/76/20240576).

¹⁴ Çırtlık, Burcu, and Simten Cosar. 2024. 'Gender Bias in AI'. *Feminist Asylum: A Journal of Critical Interventions* 2 (June). doi:[10.5195/faci.2024.124](https://doi.org/10.5195/faci.2024.124).

Examples of gender bias in hiring tools underscore the urgency of this issue. High-profile cases like Amazon's recruitment AI reveal that such tools can downgrade resumes with female-associated terms, clearly demonstrating a bias against women¹⁵. Furthermore, statistical evidence supports these findings, indicating that AI systems may show up to a 30% higher likelihood of selecting male candidates over equally qualified female candidates, which highlights a significant flaw in current AI hiring practices¹⁶.



Source: washingtontechnology.com

To combat these biases, several potential solutions have been proposed. One crucial approach involves utilizing diverse datasets during the training of AI models. By incorporating more representative data that includes a balanced mix of genders, organizations can help mitigate bias in AI training and improve fairness. Additionally, the development of fairness-aware algorithms is essential. These algorithms can be designed with built-in mechanisms that

¹⁵ Chadha, Kabir Singh. 2024. 'Bias and Fairness in Artificial Intelligence: Methods and Mitigation Strategies'. *International Journal for Research Publication and Seminar* 15 (3): 36–49. doi:[10.36676/ijrps.v15.i3.1425](https://doi.org/10.36676/ijrps.v15.i3.1425).

¹⁶ CHAUDHARY, AMIT KUMAR. 2024. 'Algorithmic Bias: An Integrative Review and Scope for Future Research'. Research Square. doi:[10.21203/rs.3.rs-4775268/v1](https://doi.org/10.21203/rs.3.rs-4775268/v1).

prioritize fairness and equity, helping to reduce biases during the hiring decision-making process¹⁷.

2. Privacy and Security Concerns:

Privacy and healthcare concerns are increasingly critical, especially regarding the risks of personal data misuse and the implications of surveillance technologies. As digital health systems become more integrated, they offer numerous benefits but also present significant vulnerabilities that can jeopardize sensitive patient information.

One of the primary risks of personal data misuse in healthcare is data breaches. Healthcare systems are prime targets for cyberattacks, resulting in unauthorized access to sensitive patient data, which can lead to identity theft and compromised patient confidentiality¹⁸. Another significant concern is insider threats; healthcare employees may misuse their access to patient information for personal gain or malicious intent, underscoring the necessity for stringent access controls and regular audits to safeguard against such risks (Pandey, 2024). Additionally, there is a lack of awareness among healthcare professionals regarding the risks associated with data security. This knowledge gap can exacerbate vulnerabilities within the system, making it easier for breaches to occur and patient data to be compromised¹⁹. The rise of surveillance technologies in healthcare also poses further privacy threats. Technologies such as Internet of Things (IoT) devices enable increased monitoring of patients, which raises significant privacy concerns. This is particularly pertinent for women, who may face additional scrutiny and potential stigma due to health data being constantly monitored²⁰. Another alarming aspect is

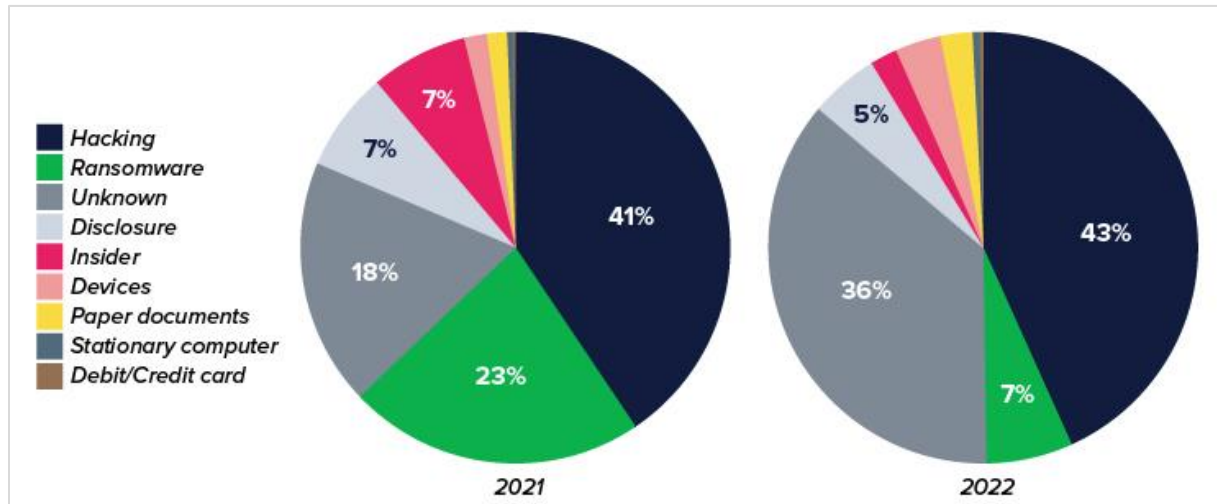
¹⁷ Mishra, Isha, Vedika Kashyap, Nancy Yadav, and Dr Ritu Pahwa. 2024. 'Harmonizing Intelligence: A Holistic Approach to Bias Mitigation in Artificial Intelligence (AI)'. *International Research Journal on Advanced Engineering Hub (IRJAEH)* 2 (07): 1978–85. doi:[10.47392/IRJAEH.2024.0270](https://doi.org/10.47392/IRJAEH.2024.0270).

¹⁸ Pandey, Kushagra. 2024. 'Security and Privacy Concerns in Implementing a Unified Health Interface (UHI) in the Indian Context'. *INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH IN ENGINEERING AND MANAGEMENT* 08 (05): 1–5. doi:[10.55041/IJSREM35061](https://doi.org/10.55041/IJSREM35061).

¹⁹ Tazi, Faiza, Archana Nandakumar, Josiah Dykstra, Prashanth Rajivan, and Sanchari Das. 2024. 'SoK: Analyzing Privacy and Security of Healthcare Data from the User Perspective'. *ACM Trans. Comput. Healthcare* 5 (2): 11:1-11:31. doi:[10.1145/3650116](https://doi.org/10.1145/3650116).

²⁰ Raheem, Muyideen Abdul, Joseph Bamdele Awotunde, Chinmay Chakraborty, Emmanuel Abidemi Adeniyi, Idowu Dauda Oladipo, and Akash Kumar Bhoi. 2023. 'Chapter 11 - Security and Privacy Concerns in Smart Healthcare System'. In *Implementation of Smart Healthcare Systems Using AI, IoT, and Blockchain*, edited by Chinmay

data profiling, which can occur when health data is used to create profiles of individuals. This practice can lead to discrimination and stigmatization, especially affecting vulnerable populations who may already be marginalized.



Medical Data breach type in USA. Source: resources.freeagentcrm.com

Despite these serious concerns, some argue that the benefits of improved healthcare delivery through technology can outweigh the risks, provided that proper safeguards are implemented. Enhanced data governance and privacy frameworks are essential in mitigating these threats, ensuring that patient information is handled securely and ethically. By prioritizing the development of robust security measures and raising awareness about data protection, the healthcare sector can create a more secure environment for managing sensitive information²¹. This approach not only protects individual privacy but also fosters trust in digital health systems, which is crucial for their successful implementation and acceptance.

3. Access Disparities and the Digital Divide

The digital divide plays a crucial role in shaping women's access to AI resources, intensifying existing socio-economic inequalities. This divide is characterized by various barriers that

Chakraborty, Subhendu Kumar Pani, Mohd Abdul Ahad, and Qin Xin, 243–73. Intelligent Data-Centric Systems. Academic Press. doi:[10.1016/B978-0-323-91916-6.00002-3](https://doi.org/10.1016/B978-0-323-91916-6.00002-3).

²¹ Faridoun, Amen, and M. Tahar Kechadi. 2024. 'Healthcare Data Governance, Privacy, and Security -- A Conceptual Framework'. arXiv. doi:[10.48550/arXiv.2403.17648](https://doi.org/10.48550/arXiv.2403.17648).

hinder women from fully engaging with and benefiting from advancements in artificial intelligence.

A key aspect of the digital divide is the gender digital divide, which highlights the systemic barriers women face in accessing information and communication technologies (ICTs). These barriers significantly limit women's engagement with AI resources and tools, restricting their ability to leverage technology for personal and professional growth²². This divide reflects broader societal inequalities, where women are often marginalized in technology access and usage. Moreover, socio-economic barriers compound these challenges. Factors such as low income, lack of education, and geographic location play pivotal roles in restricting women's access to digital technologies. Women from lower socio-economic backgrounds often find themselves at a disadvantage, as they may lack the financial resources to purchase necessary devices or access reliable internet services²³. Rural women may face heightened obstacles, with inadequate infrastructure further entrenching these inequalities.

Additionally, socio-economic factors limit the benefits women can derive from AI technologies. For instance, lower levels of digital literacy among women restrict their ability to effectively utilize AI tools, which can hinder their participation in the digital economy and their overall empowerment²⁴. This lack of digital skills is often a direct result of limited access to education and training opportunities in technology, creating a cycle of disadvantages. Another critical issue is resource accessibility; many women, especially in rural areas, have limited ownership of smartphones and inadequate internet connectivity. This lack of access to

²² Peláez-Sánchez, Iris Cristina, and Leonardo David Glasserman-Morales. 2023. 'Gender Digital Divide and Women's Digital Inclusion: A Systematic Mapping'. *Multidisciplinary Journal of Gender Studies* 12 (3): 258–82. doi:[10.17583/generos.10555](https://doi.org/10.17583/generos.10555).

²³ Roy, Paulami, Anjana Raut, Swati Samantaray, and Anvi Rana. 2024. 'Women and Digital Networking: Digital Skill Gap and Its Challenges'. In . Bhubaneswar, India: IEEE. doi:[10.1109/ASSIC60049.2024.10507999](https://doi.org/10.1109/ASSIC60049.2024.10507999).

²⁴ Lahiri, Amlan. 2024. 'Sociological Implications of the Digital Divide: Exploring Access to Information and Social Inequality in the Age of Artificial Intelligence and Automation'. *RESEARCH REVIEW International Journal of Multidisciplinary* 9 (1): 156–67. doi:[10.31305/rrijm.2024.v09.n01.019](https://doi.org/10.31305/rrijm.2024.v09.n01.019).

essential technologies severely impacts their ability to engage with AI resources, thereby reinforcing existing gender disparities in socio-economic opportunities²⁵

While the digital divide presents significant challenges, it is important to acknowledge the ongoing efforts aimed at bridging these gaps. Various initiatives are being implemented to enhance women's access to technology and AI resources, focusing on improving digital literacy, increasing technology availability, and addressing socio-economic barriers. By fostering greater inclusivity and socio-economic equity, these efforts can empower women and enable them to fully benefit from the advancements in AI, ultimately working towards narrowing the gender digital divide.

Sector-Specific AI Applications Supporting Women's Empowerment:

AI is transforming various sectors by promoting gender equity and empowering women in the workplace, politics, and social development programs. These sector-specific applications of AI provide organizations, governments, and NGOs with advanced tools to address long-standing biases, enhance skills, and foster a more inclusive environment.

1. AI in the Workplaces:

AI is increasingly acknowledged for its capacity to enhance gender diversity and equity within workplace hiring and promotion practices. By employing machine learning and AI technologies, organizations can effectively tackle the biases that have historically obstructed women's professional advancement. This exploration highlights the role of AI in fostering gender equity and the potential development of AI-driven mentorship programs for women.

²⁵ Jessy, Mubiru, Kibukamusoke Martha, and Drake Patrick Mirembe. 2024. 'Harnessing Ai for Socio-Economic Equity in Uganda: Bridging the Digital Divide through Agricultural Innovation'. *IJFMR - International Journal For Research* 6 (4). IJFMR. Accessed November 2. doi:[10.36948/ijfmr.2024.v06i04.24956](https://doi.org/10.36948/ijfmr.2024.v06i04.24956).



Source: womeninai.nl

One of the most significant contributions of AI is its ability to mitigate bias in recruitment processes. AI technologies can analyze various aspects of hiring, including job descriptions and candidate evaluations, to identify and eliminate biases that may inadvertently favor one gender over another. By fostering a more equitable hiring landscape, organizations can ensure that women receive fair consideration for positions that may have previously been dominated by men²⁶. Moreover, data-driven insights provided by machine learning algorithms allow for more objective assessments of employee performance. This capability ensures that promotions are determined based on merit rather than subjective biases, which have historically led to unequal advancement opportunities for women²⁷. By leveraging these technologies, organizations can create a more transparent and fair promotion process. AI can also play a pivotal role in policy development aimed at enhancing gender equity, particularly in male-dominated sectors such as information technology²⁸.

²⁶ Rathore, Bhumika, Meera Mathur, and Shweta Solanki. 2022. 'An Exploratory Study on Role of Artificial Intelligence in Overcoming Biases to Promote Diversity and Inclusion Practices'. In *Impact of Artificial Intelligence on Organizational Transformation*, 147–64. John Wiley & Sons, Ltd. doi:[10.1002/9781119710301.ch10](https://doi.org/10.1002/9781119710301.ch10).

²⁷ H. Choudhary, D. Pandita. 2023. "A Decision Model for the Adoption of Artificial Intelligence in Fostering DEI in the Workplace," *2023 International Conference on Decision Aid Sciences and Applications (DASA)*, 369-373, doi: [10.1109/DASA59624.2023.10286643](https://doi.org/10.1109/DASA59624.2023.10286643)

²⁸ Chowdhury, Himani, and Deepika Pandita. 2023. 'A Decision Model for the Adoption of Artificial Intelligence in Fostering DEI in the Workplace'. In , 369–73. doi:[10.1109/DASA59624.2023.10286643](https://doi.org/10.1109/DASA59624.2023.10286643).

In addition to improving hiring practices, AI can facilitate the creation of mentorship programs that connect women with industry leaders. Such initiatives enhance networking opportunities and career advancement prospects for women, allowing them to build valuable relationships that can support their professional growth. AI can also be instrumental in skill development by providing personalized learning paths tailored to individual needs. This approach helps women acquire essential skills necessary for leadership roles, directly addressing the skills gap that often contributes to gender inequality in the workplace²⁹.

2. AI in Politics and Governance for Women's Rights:

By utilizing AI-driven technologies, women gain access to resources and platforms that empower them to engage more confidently in political discourse. One essential application is in predictive safety mechanisms; these tools create safer online environments for women by identifying potential harassment risks, allowing them to participate in political discussions without fear³⁰. By fostering security, AI facilitates greater freedom for women to express their views in the political arena, often a space dominated by male voices.

In addition to providing safety, AI offers data-driven insights by analyzing public sentiment, highlighting critical issues affecting women and enabling targeted advocacy efforts³¹. For example, AI can analyze large sets of social media data to uncover trends in women's issues, ensuring that advocacy campaigns address current and pressing concerns. Furthermore, enhanced communication tools like AI-powered chatbots and other platforms enable women to communicate directly with political representatives, ensuring that their voices and concerns reach policymakers³². This improved dialogue strengthens representation by making it easier

²⁹ Yu, Chen. 2024. 'Gender Inequality in the Age of AI: Predictions, Perspectives, and Policy Recommendations'. OSF. doi:[10.31219/osf.io/5zrh9](https://doi.org/10.31219/osf.io/5zrh9).

³⁰ Amit, Pimpalkar., Nisha, Wankhade., Vikrant, Chole., Yogesh, Golhar. 2024. 1. 'Women's Empowerment Through AI'. *Advances in computational intelligence and robotics book series*, doi: 10.4018/979-8-3693-1435-7.ch019

³¹ Savaget, Paulo, Tulio Chiarini, and Steve Evans. 2019. 'Empowering Political Participation through Artificial Intelligence'. *Science and Public Policy* 46 (3): 369–80. doi:[10.1093/scipol/scy064](https://doi.org/10.1093/scipol/scy064).

³² López Belloso, María. 2022. 'Women's Rights Under AI Regulation: Fighting AI Gender Bias Through a Feminist and Intersectional Approach'. In *Law and Artificial Intelligence: Regulating AI and Applying AI in Legal Practice*, edited by Bart Custers and Eduard Fosch-Villaronga, 87–107. The Hague: T.M.C. Asser Press. doi:[10.1007/978-94-6265-523-2_5](https://doi.org/10.1007/978-94-6265-523-2_5).

for women to actively participate in the political process. Additionally, AI-based participatory governance tools invite women and other underrepresented groups to contribute their perspectives, ensuring broader inclusivity in policy decisions³³. For example, platforms that collect input from diverse communities allow women's voices to be integrated into decision-making processes, promoting fairer and more balanced governance.

Finally, AI assists with resource allocation by using data to identify areas where resources are needed most, such as in women's healthcare, education, or economic opportunities³⁴. This targeted approach helps policymakers allocate funds and services in ways that directly address gender-specific needs, further supporting equity. However, while AI presents notable opportunities for enhancing women's political engagement and advancing gender equity, the risks of biases within AI systems must be recognized. Diverse representation in AI development is essential to mitigate these biases, ensuring AI genuinely promotes inclusivity in political and policy-making spheres.

3. AI in Social Development Programs:

AI has emerged as a transformative force in social development, particularly in advancing women's empowerment and poverty alleviation through various NGO and government-led programs. By leveraging data analysis, skill-building platforms, and improved access to essential services, AI contributes to more targeted and effective interventions across these domains.

In the realm of women's empowerment, AI provides data-driven insights that identify specific barriers, such as limited economic opportunities or social constraints, enabling tailored responses to these challenges. AI-driven skill development platforms also help women acquire

³³ Konya, Andrew, Lisa Schirch, Colin Irwin, and Aviv Ovadya. 2023. 'Democratic Policy Development Using Collective Dialogues and AI'. arXiv. doi:[10.48550/arXiv.2311.02242](https://doi.org/10.48550/arXiv.2311.02242).

³⁴ Rawat, Sapna, Poonam Joshi, Gulafshan Praveen, and Jyoti Saxena. 2024. 'Chapter 17 - Role of Artificial Intelligence and Machine Learning in Women's Health'. In *Artificial Intelligence and Machine Learning for Women's Health Issues*, edited by Meenu Gupta and D. Jude Hemanth, 255–66. Academic Press. doi:[10.1016/B978-0-443-21889-7.00006-3](https://doi.org/10.1016/B978-0-443-21889-7.00006-3).

skills in areas like technology and entrepreneurship, thereby enhancing their job prospects and fostering economic independence. Moreover, AI-enabled tools facilitate access to resources such as financial services and essential information, empowering women to participate more fully in both economic and social spheres³⁵.

In poverty alleviation and education, AI has shown promising results. In healthcare, for instance, AI tools have expanded access to medical services in underserved communities, positively affecting poverty levels by improving health outcomes³⁶. Telemedicine platforms powered by AI enable healthcare access in remote areas, addressing treatable conditions that are prevalent due to geographic barriers. In education, AI-driven learning platforms deliver personalized experiences that improve learning outcomes for marginalized populations, thus preparing individuals for better employment opportunities³⁷.

AI also enhances community engagement by involving local voices in decision-making processes, which fosters a sense of inclusion and ownership in development projects³⁸. For example, some initiatives use AI to gather community feedback and incorporate it into program designs, ensuring that interventions are responsive to local needs. As these examples illustrate, AI offers scalable and impactful solutions for social development, promoting both gender equity and poverty reduction in innovative ways.

³⁵ Shahbazi, Hafizullah, Musawer Hakimi, Helena Ulusi, Behnaz Rahimi, and Tamanna Quraishi. 2024. 'Exploring the Impact of Artificial Intelligence on Women's Empowerment: A Comprehensive Survey'. *EDUTREND: Journal of Emerging Issues and Trends in Education* 1 (2): 108–20. doi:[10.59110/edutrend.333](https://doi.org/10.59110/edutrend.333).

³⁶ Hasas, Ansarullah, Musawer Hakimi, Amir Kror Shahidzay, and Abdul Wajid Fazil. 2024. 'AI for Social Good: Leveraging Artificial Intelligence for Community Development'. *Journal of Community Service and Society Empowerment* 2 (02): 196–210. doi:[10.59653/jcsse.v2i02.592](https://doi.org/10.59653/jcsse.v2i02.592).

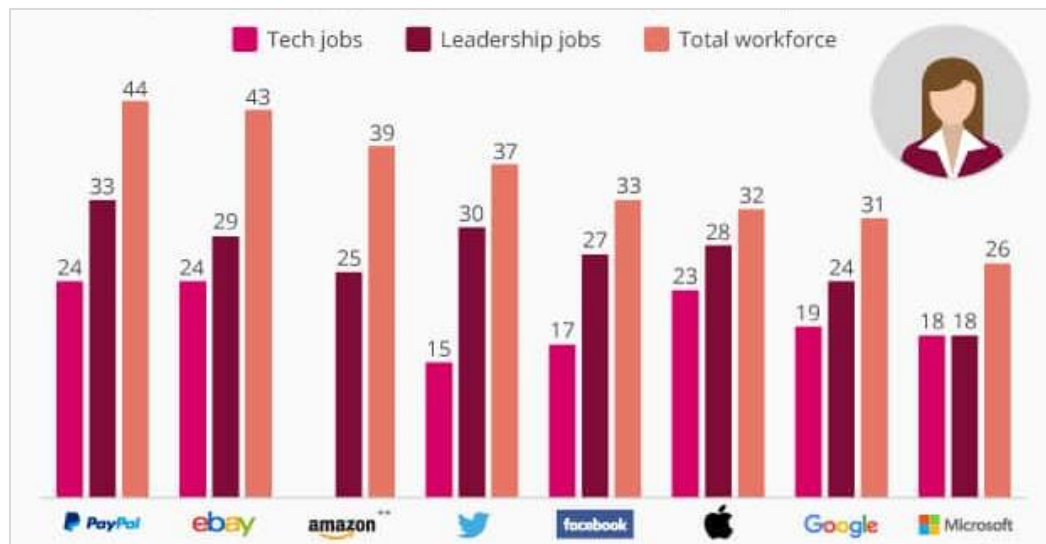
³⁷ Islam, Md Mafiqul. 2024. 'Utilizing AI for Social Good: Tackling Global Issues and Fostering Inclusive Solutions'. *Journal of Artificial Intelligence General Science (JAIGS) ISSN:3006-4023* 3 (1): 234–55. doi:[10.60087/jaigs.vol03.issue01.p255](https://doi.org/10.60087/jaigs.vol03.issue01.p255).

³⁸ Islam, Md Mafiqul. 2024. 'Utilizing AI for Social Good: Tackling Global Issues and Fostering Inclusive Solutions'. *Journal of Artificial Intelligence General Science (JAIGS) ISSN:3006-4023* 3 (1): 341–62. doi:[10.60087/jaigs.v3i1.124](https://doi.org/10.60087/jaigs.v3i1.124).

Strategies for Inclusive and Ethical AI Development:

1. Diversity in AI Development Teams:

The inclusion of women in AI and tech fields is essential for reducing biases in AI solutions, as diverse teams bring broader perspectives that can help create fairer and more inclusive outcomes³⁹. Gender diversity in these fields contributes to bias reduction since varied viewpoints can detect and correct potential biases that might be missed by a more homogenous team. Furthermore, diversity fosters enhanced innovation by improving creativity and problem-solving skills, which are critical in tech development⁴⁰.



Percentage of female employees in major tech companies. Source: Statista

To promote gender diversity, several initiatives have shown promise. Policy implementation that supports long-term gender inclusion has been effective in increasing women's participation in tech roles. Additionally, mentorship programs provide guidance and support

³⁹ Çırtlık, Burcu, and Simten Cosar. 2024. 'Gender Bias in AI'. *Feminist Asylum: A Journal of Critical Interventions* 2 (June). doi:[10.5195/faci.2024.124](https://doi.org/10.5195/faci.2024.124).

⁴⁰ Ezeugwa, Favour Amarachi, Oluwaseun Oladeji Olaniyi, Jennifer Chinelo Ugonnia, Abayomi Shamsudeen Arigbabu, and Princess Chimmy Joeaneke. 2024. 'Artificial Intelligence, Big Data, and Cloud Infrastructures: Policy Recommendations for Enhancing Women's Participation in the Tech-Driven Economy'. *Journal of Engineering Research and Reports* 26 (6): 1–16. doi:[10.9734/jerr/2024/v26i61158](https://doi.org/10.9734/jerr/2024/v26i61158).

to help women overcome career challenges, while generative AI tools facilitate inclusive analytics, enabling collaboration and equitable team dynamics in STEM⁴¹.

However, challenges remain, including the need for more inclusive education pathways and addressing psychological barriers that can deter women from tech career⁴². These efforts are crucial to creating a more equitable and innovative tech environment.

2. Ethical Standards and Frameworks in AI:

The ethical application of AI in empowerment initiatives demands robust policy frameworks and international collaboration to uphold standards of equality and human rights. To mitigate biases in AI such as those related to race, gender, or age establishing comprehensive ethical guidelines is critical⁴³. This involves not only identifying and minimizing algorithmic biases but also ensuring accountability mechanisms within AI systems. A multidisciplinary approach is essential, with diverse stakeholders, including ethicists and technologists, contributing to the development of AI systems that align with ethical norms⁴⁴. By involving experts from various fields, organizations can create AI solutions that address ethical challenges while advancing inclusiveness.

International cooperation is equally vital in establishing consistent ethical practices across borders. Standardization efforts by international bodies, including regulatory measures in several countries, reflect a global push towards ethical AI practices. Organizations like the OECD and UNESCO play pivotal roles in formulating and promoting global standards that

⁴¹ Nixon, Nia, Yiwen Lin, and Lauren Snow. 2024. 'Catalyzing Equity in STEM Teams: Harnessing Generative AI for Inclusion and Diversity'. *Policy Insights from the Behavioral and Brain Sciences* 11 (1): 85–92. doi:[10.1177/23727322231220356](https://doi.org/10.1177/23727322231220356).

⁴² Ulicane, Inga. 2024. 'Intersectionality in Artificial Intelligence: Framing Concerns and Recommendations for Action | Article | Social Inclusion', April. <https://www.cogitatiopress.com/socialinclusion/article/view/7543>.

⁴³ Ibrahim, Shurooq Mnawer, Mohammad Alshraideh, Martin Leiner, Iyad Muhsen AlDajani, and Ouarda Bettaz. 2024. 'Artificial Intelligence Ethics: Ethical Consideration and Regulations from Theory to Practice'. *IAES International Journal of Artificial Intelligence (IJ-AI)* 13 (3): 3703–14. doi:[10.11591/ijai.v13.i3.pp3703-3714](https://doi.org/10.11591/ijai.v13.i3.pp3703-3714).

⁴⁴ Sandfreni, Ritika Bansal. 2024. 'Challenges in Large Language Model Development and AI Ethics'. *Challenges in Large Language Model Development and AI Ethics*, 25-81. Hershey, PA: IGI Global. doi:[10.4018/979-8-3693-3860-5.ch002](https://doi.org/10.4018/979-8-3693-3860-5.ch002)

enhance fairness and inclusivity in AI applications⁴⁵. These standards serve as a foundation for countries to adopt similar ethical principles, ensuring that AI development and deployment are aligned with universal values. Additionally, ethical guidelines must evolve with AI's rapid advancements, making global collaboration an ongoing necessity.

International bodies not only set standards but also monitor compliance, reinforcing ethical practices across different regions. By overseeing the implementation of ethical frameworks, these organizations can ensure that guidelines are adhered to, holding developers and organizations accountable⁴⁶. However, a significant challenge remains: balancing the need for stringent regulations with the potential impact on innovation. Overly strict guidelines may hinder technological advancements, making it essential to strike a balance that promotes ethics and allows room for innovation. This balance between ethical oversight and technological progress remains a central consideration in AI policy development.

Future Directions for AI in Women's Empowerment

Emerging AI technologies, such as bias-detection algorithms and natural language processing, hold significant potential to empower women. These tools can increase women's access to education, enhance their skills, and create safer online spaces for engagement. By developing AI solutions that address gender-specific needs, we can help close the existing gaps and provide more inclusive platforms for women across various fields. Policy advocacy and targeted investment in women-focused AI is crucial to making these advances possible. Policymakers and investors can drive equitable AI by prioritizing solutions that cater to women, such as career development programs and digital safety features. Clear ethical guidelines and accountability standards can ensure these tools serve women effectively, mitigating biases and supporting women's growth in meaningful ways. Collaboration among governments, the private sector, and civil society is essential for

⁴⁵ Firmansyah, Gerry, Shavi Bansal, Ankita Manohar Walawalkar, Suman Kumar, Sourasis Chattopadhyay, Gerry Firmansyah, Shavi Bansal, Ankita Manohar Walawalkar, Suman Kumar, and Sourasis Chattopadhyay. 1AD. 'The Future of Ethical AI'. In <https://Services.Igi-Global.Com/Resolvedoi/Resolve.aspx?Doi=10.4018/979-8-3693-3860-5.Ch005>. IGI Global. doi:[10.4018/979-8-3693-3860-5.ch005](https://doi.org/10.4018/979-8-3693-3860-5.ch005).

⁴⁶ Patil, Shivagouda M. 2024. 'Regulatory Frameworks for Ethical AI Development in Coding'. *International Journal for Research in Applied Science and Engineering Technology* 12 (6): 2018–24. doi:[10.22214/ijraset.2024.63445](https://doi.org/10.22214/ijraset.2024.63445).

ensuring that AI's benefits reach women equitably. When these stakeholders work together, they can create a more gender-inclusive environment within workplaces, educational settings, and governance. By committing responsible, gender-conscious AI practices, they can drive forward a future where AI actively supports gender equality and social progress.