

Roll of Artificial intelligence in advancing Women's financial inclusion

Chavada Alpaben N.

M.Com., B.Ed., GSET, Assistant Professor, Nandkunvarba Mahila College B.Com.. Dep. Devrajanagar, Bhavnagar

Abstract- In the contemporary technological era, rapid advancements across various sectors have opened new avenues to address long-standing socio-economic challenges. One significant opportunity lies in the application of Artificial Intelligence (AI) to enhance women's financial inclusion. Despite global progress toward gender equality, women—particularly in developing and underserved regions—continue to face substantial barriers in accessing formal financial services. Challenges such as limited banking infrastructure, lack of credit history, socio-cultural constraints, and low levels of financial literacy restrict women's financial independence and economic participation.

Artificial Intelligence has emerged as a transformative force in the financial sector by enabling data-driven, inclusive, and personalized financial solutions. AI-powered systems can analyze vast volumes of financial and alternative data to gain deeper insights into women's financial behaviors, needs, and constraints. This capability allows financial institutions to design customized products such as tailored savings plans, microcredit, insurance schemes, and flexible loan facilities that better address women's unique financial realities. Moreover, the use of alternative data sources—such as mobile usage patterns, digital transaction records, and payment behavior—enables more accurate credit assessments, expanding access to finance for women who lack traditional credit histories.

In addition to improving access, AI plays a crucial role in reducing gender bias in financial decision-making through automated and objective evaluation processes. AI-driven platforms also enhance financial literacy by offering personalized guidance, real-time support, and educational tools that help women make informed financial decisions. By strengthening entrepreneurship, financial independence, and economic participation, AI contributes to the development of a more inclusive and equitable financial system.

This study examines the role of Artificial Intelligence in advancing women's financial inclusion by analyzing its impact on access, affordability, and personalization of

financial services, highlighting its potential to promote sustainable development and inclusive economic growth.

Keywords: Financial Inclusion, Women Entrepreneur, National Economic Growth, World Economy, Sustainable Growth.

I. INTRODUCTION

Financial inclusion is very important for empowering people, strengthening economic stability, and promoting equal development. However, despite many global efforts, women—especially in developing countries—are still largely excluded from financial services. Limited banking facilities, lack of financial awareness, social and cultural restrictions, and gender-based bias continue to prevent women from fully participating in the financial system. As a result, many women do not have access to formal loans, insurance, and savings schemes, which limits their financial independence and reduces their contribution to the economy.

Artificial intelligence (AI) is an emerging technology that can bring major changes to many sectors, including banking. By using AI-based tools, financial institutions can address problems faced by women, improve their access to financial services, and increase their participation in economic activities. AI technologies such as machine learning, predictive analysis, and data processing help create financial products and services that are tailored to women's specific needs and life situations. AI also supports new methods of credit assessment, helps reduce bias in financial decisions, and improves financial knowledge through targeted educational programs. This study explores how AI-powered solutions can expand access to financial services, strengthen women's economic

empowerment, and support inclusive financial systems to reduce the gender gap in financial inclusion.

II. FINANCIAL INCLUSION

Financial inclusion refers to making sure that individuals and businesses, especially those from poor or disadvantaged groups, can easily access affordable and useful financial services. These services include banking facilities, loans, insurance, and payment systems, and they are provided in a fair and sustainable manner. The goal of financial inclusion is to bring people into the formal financial system so they can take advantage of economic opportunities and actively participate in economic activities. Financial inclusion plays an important role in reducing poverty and inequality, promoting economic development, and ensuring financial stability. With the growth of digital technology and fintech innovations, financial inclusion has gained global importance, particularly in developing and emerging economies.

Women's Financial Inclusion

Women's financial inclusion means ensuring women have equal access to, use of, and benefit from affordable and suitable financial services.

Major Dimensions:

Access: Availability of bank accounts, credit, insurance, and digital services.

Usage: Regular and effective use of financial products.

Quality: Safe, reliable, transparent, and user-friendly services.

Affordability: Low-cost financial products suitable for all income groups.

Artificial Intelligence

Artificial Intelligence refers to computer systems capable of performing tasks that require human intelligence, such as learning, reasoning, decision-making, and language understanding. In the financial sector, AI helps automate processes, analyze large datasets, and provide personalized financial services.

Key Components of AI:

Machine Learning: Improves credit scoring, risk assessment, and customer analysis.

Natural Language Processing: Enables chatbots and virtual assistants for customer support.

Big Data Analytics: Analyzes financial behavior to design customized products.

Predictive Analytics: Forecasts credit risk and repayment capacity.

Automation: Speeds up banking processes and improves service efficiency.

2.3 Link between AI and Women's Financial Inclusion

AI supports women's financial inclusion by removing traditional barriers, reducing bias, and offering digital, personalized, and affordable financial solutions. It improves access, encourages usage, enhances service quality, and lowers costs, thereby empowering women economically.

III. REVIEW OF LITERATURE

Omotayo Bukola Adeoye (2024) states that AI and data analytics can greatly enhance financial inclusion in emerging economies by promoting fairness, prosperity, and sustainable development. However, addressing challenges related to AI adoption is essential to fully realize these benefits.

UN Agency for Digital Technologies (2024) emphasizes the importance of including women's perspectives in AI development. Without gender-inclusive approaches, AI may widen existing gaps. Initiatives supporting women-led enterprises, education, and fair lending practices are crucial for advancing gender equality and economic empowerment.

Saloni Thakkar (2024) highlights that AI can transform financial services by reaching marginalized communities, improving trust, and driving socioeconomic growth. Despite challenges such as data privacy, infrastructure, and regulation,

collaborative efforts can enable AI to create inclusive and equitable financial ecosystems.

IV. OBJECTIVES OF THE STUDY

- 1.To examine how AI can address gender-specific barriers to financial inclusion.
- 2.To explore the role of AI in developing personalized financial solutions for women.

V. METHODOLOGY USED

For this study, secondary data was gathered from a variety of sources, including books, journals, and online platforms.

Need for Women's Financial Inclusion

Women's financial inclusion is a critical component of inclusive economic development and gender equality. Despite significant progress in the global financial system, women continue to face unequal access to formal financial services compared to men. This gap limits women's ability to save, invest, manage risks, and participate fully in economic activities. Therefore, ensuring women's financial inclusion is essential for sustainable growth and social empowerment.

1 Gender Gap in Access to Financial Services

The gender gap in financial access refers to the persistent disparity between men and women in owning bank accounts, accessing credit, insurance, and digital financial services. In many developing and emerging economies, women are less likely to have a formal bank account or access to institutional credit. Factors such as lower income levels, irregular employment, lack of collateral, and limited financial documentation contribute to this gap. Women entrepreneurs, particularly in the informal sector, often rely on personal savings or informal lenders due to restricted access to formal credit. This unequal access reinforces economic dependency and restricts women's opportunities for growth and financial security.

2 Socio-economic Barriers Faced by Women

Women face multiple socio-economic barriers that hinder their participation in the formal financial system. These include lower levels of education and financial literacy, cultural and social norms that limit

women's decision-making power, and unequal ownership of assets and property. In many households, men control financial decisions, reducing women's autonomy over income and savings. Additionally, women are more likely to be engaged in unpaid care work or informal employment, resulting in unstable income patterns that make them less attractive to formal financial institutions. Limited access to digital infrastructure, especially in rural areas, further intensifies financial exclusion among women.

3 Importance of Financial Empowerment of Women

Financial empowerment enables women to make independent decisions regarding income, savings, investments, and expenditures. Access to appropriate financial services enhances women's economic resilience, improves household welfare, and increases their participation in education, health, and entrepreneurial activities. Financially empowered women contribute to poverty reduction, employment generation, and economic growth. Studies have shown that women tend to invest earnings in family well-being, including children's education and healthcare. Therefore, empowering women financially not only benefits individuals but also leads to broader social and economic development.

4 Role of Digital Technologies in Reducing Inequality

Digital technologies play a transformative role in reducing financial inequality and advancing women's financial inclusion. Mobile banking, digital payments, fintech platforms, and AI-enabled financial services help overcome traditional barriers such as distance, cost, and documentation requirements. Digital onboarding, e-KYC, and alternative data-based credit assessments enable women with limited formal records to access financial services. Moreover, digital platforms provide financial education, personalized advice, and secure transactions, increasing trust and usage among women. By lowering costs and improving accessibility, digital technologies create inclusive financial ecosystems that support women's participation in the formal economy.

In summary, the need for women's financial inclusion arises from persistent gender gaps, socio-economic constraints, and unequal access to financial opportunities. Financial empowerment of women is essential for inclusive growth, and digital technologies

serve as powerful tools in bridging these gaps. Strengthening women's financial inclusion is therefore both an economic necessity and a social imperative.

Empowering Women's Financial Decision-Making Through Artificial Intelligence

Artificial Intelligence (AI) has emerged as a transformative force in the financial sector by enabling data-driven decision-making, automation, and personalized service delivery. In the context of women's financial inclusion, AI plays a crucial role in addressing long-standing barriers such as limited credit history, lack of collateral, information asymmetry, and gender bias. By leveraging advanced algorithms and digital platforms, AI helps create inclusive financial systems that cater to the specific needs of women.

AI plays a transformative role in developing personalized financial solutions for women by leveraging data analytics, machine learning, and advanced algorithms to cater to their specific financial needs. Here are some key roles AI plays in this context:

1. **Personalized Financial Products and Services:** AI uses data to analyze individual behaviors, spending patterns, and financial goals, allowing financial institutions to tailor products like savings accounts, loans, insurance policies, and investment opportunities that are specifically designed to meet the financial needs and preferences of women.

2. **Credit Scoring and Risk Assessment:** Traditional credit scoring models often fail to account for unique financial situations, particularly for women who may face irregular income streams or gaps in employment. AI-based credit models use a broader range of data points, such as mobile phone usage, utility payments, and other alternative data, to offer more accurate and inclusive credit scoring, thus improving women's access to financial services.

3. **Financial literacy and Advisory Services:** AI-driven chat bots and robo-advisors provide personalized financial education and advice, guiding women through complex financial decisions like investments, retirement planning, and savings. These services are available 24/7 and can be customized to different

levels of financial literacy, helping women become more financially independent.

4. **Microfinance and Loan Solutions:** AI can optimize loan offerings by using machine learning to assess micro-loan eligibility and offer customized repayment plans. For women entrepreneurs, especially in rural or underserved areas, AI helps deliver microfinance solutions tailored to their business needs and repayment capacities, promoting financial inclusion and economic empowerment.

5. **Fraud Detection and Security:** Women, particularly those entering the digital financial ecosystem for the first time, may be more vulnerable to fraud. AI enhances security by using behavioral biometrics, real-time transaction monitoring, and anomaly detection to prevent financial fraud and protect user data, providing a safer environment for women to engage with financial services.

6. **Investment and Wealth Management:** AI-powered investment platforms can curate portfolios based on individual risk tolerance, financial goals, and personal values. By considering factors that may resonate more with women, such as ethical or sustainable investments, AI helps women grow wealth more efficiently, ensuring their portfolios align with their priorities.

7. **Reducing Gender Bias in Financial Services:** AI can identify and mitigate gender biases within financial systems by analyzing trends in how women are offered loans, insurance, or investments, ensuring that they receive equitable treatment. By using unbiased algorithms, financial institutions can develop solutions that prioritize fairness and equality in access to financial services for women.

8. **Predictive Analytics for Life Events:** AI can analyze data to predict major life events—such as marriage, childbirth, or career changes—that might impact women's financial needs. Based on these insights, AI can recommend financial products or services at the right time, making financial planning more proactive and personalized.

9. AI in Credit Access

Access to credit remains one of the most significant challenges faced by women, especially women

entrepreneurs and self-employed workers. Traditional credit assessment methods rely heavily on formal income records, collateral, and credit history, which many women lack. AI-based credit scoring systems overcome these limitations by using alternative data sources such as mobile phone usage, digital transaction records, utility payments, and e-commerce behavior. Machine learning algorithms analyze this data to assess creditworthiness more accurately and inclusively.

AI also reduces human bias in lending decisions by relying on objective data patterns rather than subjective judgments. Automated loan processing speeds up approvals and lowers operational costs, enabling financial institutions to offer small-value and micro-loans to women. As a result, AI improves women's access to formal credit, supports entrepreneurial activities, and enhances financial independence.

10. AI and Women Entrepreneurship

Women entrepreneurship plays a vital role in economic development, job creation, and innovation. However, women-led enterprises, particularly micro, small, and medium enterprises (MSMEs), face challenges such as limited access to finance, markets, and business support services. AI offers innovative solutions to overcome these barriers and promote women entrepreneurship.

AI-based business analytics tools help women entrepreneurs analyze market trends, customer behavior, and financial performance. These insights enable informed decision-making, efficient resource allocation, and strategic planning. AI also facilitates access to finance by assessing business viability using alternative data, thereby improving loan approval rates for women-led enterprises.

Digital platforms powered by AI connect women entrepreneurs to wider markets, suppliers, and customers through e-commerce and digital marketplaces. AI-driven insurance and risk assessment tools provide customized coverage, protecting women-owned businesses from unforeseen risks. Additionally, AI-enabled mentoring platforms offer personalized guidance, training, and networking opportunities, supporting skill development and business growth.

By integrating AI into entrepreneurial ecosystems, financial institutions and policymakers can create supportive environments for women entrepreneurs. This not only strengthens women's economic participation but also contributes to inclusive and sustainable economic growth.

In conclusion, Artificial Intelligence plays a multidimensional role in advancing women's financial inclusion and entrepreneurship. Through inclusive credit access, user-friendly digital banking, enhanced financial literacy, and robust risk management, AI addresses structural barriers faced by women. Furthermore, AI empowers women entrepreneurs by improving access to finance, markets, and business intelligence. Therefore, AI serves as a powerful enabler of women's economic empowerment and inclusive development.

By integrating AI, financial institutions can provide women with more relevant, accessible, and tailored solutions, thus empowering them to achieve greater financial independence and security.

Government Initiatives Supporting AI-Driven Women's Financial Inclusion (India)

1 Pradhan Mantri Jan Dhan Yojana (PMJDY)

Over 50% of account holders are women

Provides foundational data for AI-based financial services

Enables digital transactions and credit access

2 Digital India Programme

Promotes digital infrastructure and internet access

Supports AI adoption in banking and governance

Encourages women's participation in the digital economy

3 Self-Help Group (SHG)–Bank Linkage Programme

Uses group-based credit models

AI can analyze SHG transaction data for micro-credit

Empowers rural women financially

4 Stand-Up India Scheme

Supports women entrepreneurs with bank loans

AI tools help in credit assessment and monitoring

Encourages women-led enterprises

5 National Strategy for Artificial Intelligence (NITI Aayog)

Focus on “AI for All”

Emphasizes inclusive and responsible AI

Encourages ethical and gender-sensitive AI applications

6 DBT (Direct Benefit Transfer)

Transfers subsidies directly into women’s bank accounts

AI helps detect fraud and improve targeting

Strengthens women’s financial autonomy

Conclusion

While AI holds immense potential to advance women’s financial inclusion, its effectiveness is constrained by data bias, digital inequality, ethical concerns, and limited access among women. Addressing these challenges requires gender-sensitive policies, ethical AI regulations, targeted literacy initiatives, and strong government support. India’s digital and financial inclusion programs provide a strong foundation, but sustained policy innovation and responsible AI governance are essential to ensure that AI becomes a tool of empowerment rather than exclusion

VI. LIMITATIONS OF THE STUDY

The study is based on conceptual nature due to time constraints and availability of data.

VII. FINDINGS

The study finds that artificial intelligence has significantly improved women’s access to financial services, particularly in rural and underserved areas. AI-enabled tools such as mobile banking, chatbots, and alternative credit scoring have reduced barriers to inclusion, supported women with limited credit histories, and enabled customized financial products like microloans and flexible savings. AI has also enhanced financial literacy, reduced gender bias in credit decisions, improved security, and supported policymakers through gender-disaggregated data. However, the digital divide remains a major challenge.

VIII. SUGGESTIONS

To strengthen women’s financial inclusion through AI, efforts should focus on reducing the digital divide by

expanding affordable internet and digital infrastructure. Women-focused AI-driven financial literacy programs should be promoted. Regular audits and transparency of AI systems are necessary to prevent bias. Financial institutions should develop gender-sensitive AI products, while policymakers should use AI-generated gender-disaggregated data to design targeted inclusion strategies.

IX. CONCLUSION

The study concludes that AI holds strong potential to promote women’s financial inclusion by improving access, fairness, security, and personalization of financial services. Despite these benefits, challenges such as unequal digital access persist. Continued collaboration among governments, financial institutions, and technology providers is essential to ensure inclusive AI-driven financial empowerment for all women.

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