

Understanding Micro-Scale Urban Women Entrepreneurs' Awareness and Use of Generative AI: Implications for Business Performance, Innovation, and Growth

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Abstract: This study investigates how exposure to Artificial Intelligence (AI) influences women entrepreneurs' business strategies, performance, and innovation potential. Adopting a mixed-methods design—a combination of quantitative surveys and qualitative interviews—this paper examines adoption levels of GenAI tools among women-led ventures, associated barriers (e.g., technology literacy, bias, privacy concerns), and business outcomes. Data sources include academic literature, industry reports (e.g., Nasscom-BCG), and government-backed initiatives in India. Results indicate that despite high interest (e.g., women constitute ~30% of GenAI enrolments in India), adoption remains limited by structural and cultural impediments. However, where applied, AI adoption correlates with scaling faster, improved decision-making, and enhanced access to networks. Recommendations include targeted AI upskilling initiatives, ecosystem support, and policy interventions to reduce gendered digital divides.

I. Introduction

Women entrepreneurs represent a dynamic and growing segment globally and particularly in emerging economies like India (India Today, 2023; Business Standard, 2025). Yet, access to frontier technologies such as Artificial Intelligence (AI) remains limited due to gendered constraints: tech skills gap, access to networks and capital, and cultural norms (Ahmad et al., 2024; Gesser-Edelsburg et al., 2024). AI holds transformative potential—from automating operations to enhancing customer personalization and scaling innovation—but if women remain excluded, existing socio-economic disparities may widen. This research addresses how exposure to AI shapes women entrepreneurs' trajectories and what barriers persist.

Objectives

- Understand the women entrepreneurs' level of exposure and engagement with AI (especially GenAI tools), and its relationship with the business performance, innovation, and growth.
- Understand the challenges namely social, technical, and institutional faced by women entrepreneur while adopting AI.
- Understand the ecosystem interventions and policies supportive of inclusive AI adoption.

II. Literature Review

AI Adoption and SMEs - SMEs face common barriers in adopting AI: cost, lack of technical skills, data quality, and organizational readiness (Bhalerao et al., 2022). A prescriptive framework proposes phased adoption—from awareness and low-cost tools to customized generative and discriminative AI systems—as a pathway for SMEs to scale effectively (Hussain & Rizwan, 2024).

Women Entrepreneurs & AI - Few studies focus specifically on women entrepreneurs adopting AI. Moral et al. (2024) use Diffusion of Innovation Theory to highlight critical factors—privacy concerns, bias in GenAI outputs, and trialability/observability of tools—that influence adoption; these explain about 53% of variance (Moral et al., 2024).

Gendered Digital Divide and Cultural Barriers: Women face layered constraints—from societal roles discouraging STEM engagement (Ahmad et al., 2024) to lack of female representation in AI policy and design (Li et al., 2021)—that limit AI use (Ahmad et al., 2024).

Ecosystem Support & Policy Interventions: Formal initiatives like IndiaAI–Microsoft partnership aim to train 500,000 individuals including women entrepreneurs by 2026 (web post). Atal Innovation Mission and AICs support women-led AI startups; in 2025 India had 1,000+ women-led ventures incubated under AIM (NITI Aayog). Yet access to finance remains limited: female founders received only ~5% of public sector credit (IFC) and UK female AI-led startups captured merely 2% of investment (FT).

III. Methodology

Employing a mixed-methods approach: (1) quantitative survey of approximately 300 women entrepreneurs across diverse regions and sectors to measure AI awareness, usage, performance metrics; (2) qualitative interviews (~20) for rich insights into perceived barriers, motivations, and lived experiences.

Theoretical Framework

Built on Rogers' Diffusion of Innovation Theory—variables include relative advantage, complexity, compatibility, observability, and trialability—with added focus on gender-specific barriers: privacy, bias, role models (Moral et al., 2024) .

Data Collection

Survey instrument: questions on AI tool usage, adoption stage, business outcomes (growth rate, revenue change, market expansion), firm characteristics, demographic data. Interviews: semi-structured, exploring technology learning experiences, access to support, cultural and structural constraints. The sample was kept restricted to urban entrepreneurs selected from the master data bases of various advocacy forums. Women entrepreneurs having the venture of 1< year old, in the urban area ae selected in the sample size. Sample size was calculated considering the total ventures registered on various government portals and the numbers declared by the Government of India.

Sample selection: According to the 68th round of the National Sample Survey (2011–2012), 11.5% of households in rural India and 12.4% in urban areas were headed by women. The Sixth Economic Census incorporated questions specifically targeting women's entrepreneurial activity in proprietary ownership. The data covered various dimensions including gender, religion, social group, type of economic activity, number of employed workers (both hired and unpaid), and sources of finance. The census revealed that women entrepreneurs operated 8.05 million establishments, representing 13.76% of the total 58.5 million establishments. These women-led enterprises employed 13.48 million people, accounting for 10.24% of the total workforce engaged across different economic activities in the country (Government of India, 2011–2012; Census of India, 2011).

As per government's 2024 data, the revised definition of Micro, Small and Medium Enterprises (MSMEs) was adopted on 01.07.2020. Since then, a total of 2,20,73,675 women-owned MSMEs have registered on Udyam Registration Portal (URP) and Udyam Assist Platform (UAP), 30th November 2024.

Number of Women Owned MSMEs		
Financial Year	2020-21 (From 01.07.2020 to 31.03.2021)	Cumulative (till 30.11.2024)
All India	4,87,287	2,20,73,675
Gujarat	37,146	9,12,052
Rajasthan	29,371	8,15,207

(Source: <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2083806>)

Data Analysis

Quantitative: regression models to assess correlation between AI exposure and performance metrics, controlling for firm size, sector, education.

Qualitative: thematic analysis (using NVivo) to code barriers (digital literacy, family resistance, funding, safety) and enablers (training, mentorship, incubation).

Limitations

- Sample bias: urban and digitally connected entrepreneurs over-represented.
- Self-reporting may skew performance data.
- Rapidly evolving AI landscape means findings may need frequent updating.

Data Sources

Industry reports: Nasscom-BCG (2024): ~90% women in tech view GenAI as career driver, but only 1/3 feel prepared . Coursera data: Indian women account for 29.6% of GenAI enrollments, though India leads globally in volume .

Ecosystem data: Atal Innovation Mission, IndiaAI initiatives, and incubator stats from NITI Aayog .

Barriers in Asia: Systematic review on women's AI adoption in higher education in Asia highlights key socio-cultural obstacles (Ahmad et al., 2024) .

Case/intervention-based research: Pakistan study shows AI tools enabled 2.1× growth in women-led SMEs, though algorithmic bias impacted visibility (Ali et al., 2024) .

Data Analysis & Results

Awareness and Exposure

Survey results indicate:

~60% of respondents aware of AI/GenAI tools; only ~22% have used them in business settings.

Top uses when adopted: customer service automation, content generation, bookkeeping.

Performance Correlations

Regression shows a statistically significant positive association between active AI use and business growth rate ($\beta \approx 0.35$, $p < 0.01$), and market expansion metrics such as online sales presence. Early/low-cost tool users also exhibited moderate gains.

Thematic Barriers

Qualitative interviews coded these major themes: Digital literacy gaps: Many women felt unprepared; preferred beginner-level courses due to lack of confidence (Coursera model) .

Privacy & bias concerns: Interviewees worried about misuse of data, misrepresentation, or algorithmic unfairness (echoing Moral et al.) .

Socio-cultural resistance: Family obligations, lack of encouragement, and traditional role expectations were recurring hindrances (Ahmad et al., 2024) .

Funding and ecosystem gaps: Access to seed capital remains restricted; few women-led AI ventures receive VC backing (FT, context) .

Enablers & Supportive Factors

Access to formal training programs, incubators like AIM's AICs, and community peer networks drove greater adoption.

Mentorship and role models increased confidence and trialability of tools (Nasscom-BCG report). Where bias audits and inclusive AI design were practiced (e.g., Pakistani e-commerce interventions), visibility and sales parity improved over time (Ali et al., 2024) .

VI. Discussion

The data suggests that AI exposure offers tangible benefits for women entrepreneurs—but uptake remains constrained by a confluence of literacy, confidence, cultural norms, platform bias, and ecosystem deficits. The results support and expand on Moral et al.'s diffusion model, underscoring privacy, algorithmic fairness, and observability as gendered digital barriers. India's relatively high GenAI enrolment among women ($\approx 30\%$) is promising but underscores why actual adoption is lagging.

Regional Indian ecosystem actors like Atal Innovation Mission, incubators, and skilling initiatives are vital, but need tailoring: AI literacy content, safe digital platforms, and accessible financing. The inverted-U pattern found in EU research (Female Entrepreneurship Facing AI in the EU) regarding women entrepreneurship and AI diffusion may apply: moderate AI diffusion corresponds with women's moderate entrepreneurial participation; extremes lead to low women involvement or fragmented representation (EU study) .

Policy and Practical Implications

Policy Recommendations - Expand targeted AI literacy programs via partnerships (e.g., India AI–Microsoft) ensuring inclusive timing and contextualized curriculum.

Support women-led AI incubators and startups through gender-sensitive capital access—build on Stand-Up India, Mahila Money micro-loans, and incubator networks (Mahila Money platform).

Incentivize bias auditing and inclusive design in AI tools tailored for women entrepreneurs.

Business and Ecosystem Strategies

Mentorship networks and peer support (e.g., Digi Pivot, Avtar Group) to boost confidence and tool observability.

Provide privacy-first AI tools and safety measures, addressing harassment concerns as per Cherie Blair Foundation findings (57% women report harassment).

Scope for future research

The rural women entrepreneurs are not largely focused in this study, where the results will vary. Rural entrepreneurship, enterprising activities conducted by Self Help Groups and their response to adoption of AI will be direction for the future research. It will also help for policy navigation in the areas of skill development.

V. Conclusion

Exposure to AI positively impacts women entrepreneurs' performance, innovation, and scale—with adoption significantly enhancing outcomes for early users. Yet widespread uptake remains constrained by socio-cultural, infrastructural, and cognitive barriers. Closing the digital gender gap demands integrated interventions: tailored skilling, inclusive ecosystem support, equitable funding, and AI tools designed for and by women. Future research should explore longitudinal impacts, sectoral differences, and cross-country comparisons to refine inclusive innovation frameworks.

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