



Digital Transformation and Women Entrepreneurship in the Doaba Region of Punjab, India: A Systematic Review of Adoption Barriers and Enablers

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ABSTRACT

Digital transformation is reshaping entrepreneurial ecosystems by enabling new forms of business creation, market access and operational efficiency. However, women entrepreneurs often face persistent structural, socio-cultural and technological constraints that limit effective adoption of digital tools and platforms. These challenges are particularly evident in semi-rural regions such as the Doaba region of Punjab, India, where traditional entrepreneurial practices intersect with emerging digital opportunities. This study aims to systematically review and synthesize existing literature on the adoption of digital transformation among women entrepreneurs, focusing specifically on identifying key barriers and enablers influencing this process in the Doaba region context. A systematic literature review was conducted following PRISMA 2020 guidelines. Relevant studies were retrieved from major academic databases, including Scopus, Web of Science, ScienceDirect, SpringerLink and Google Scholar. Predefined inclusion and exclusion criteria were applied to select peer-reviewed studies addressing digital transformation and women entrepreneurship. The final set of studies was analyzed using thematic synthesis to identify recurring patterns and categorize influencing factors. The review identifies four major categories of barriers: technological limitations, economic constraints, socio-cultural challenges and institutional gaps. Main enablers include government initiatives, improved digital infrastructure,



skill development programs and access to digital platforms and networks. These factors collectively shape the adoption landscape for women entrepreneurs in the region. The findings highlight that digital transformation adoption among women entrepreneurs is a multidimensional process shaped by interrelated structural and contextual factors. Strengthening institutional support, enhancing digital literacy and improving access to affordable technologies are essential for promoting inclusive and sustainable entrepreneurial development in regions like Doaba.

1. INTRODUCTION

Digital Transformation in the Global Business Landscape: Digital transformation has emerged as a fundamental driver of structural change in contemporary economies, reshaping how businesses operate, compete and create value. It refers to the integration of digital technologies such as mobile platforms, cloud computing, e-commerce systems and data-driven tools into business processes and entrepreneurial models. Globally, this transformation has enabled firms to enhance operational efficiency, expand market reach and improve decision-making capabilities. As economies become increasingly digitalized, the ability to adopt and effectively utilize digital technologies has become a key determinant of entrepreneurial success and sustainability.

Women Entrepreneurship and Inclusive Economic Development: Women entrepreneurship plays a crucial role in promoting inclusive economic growth, employment generation and social development. It contributes not only to household income but also to broader community-level economic resilience. However, women entrepreneurs continue to face persistent structural and socio-cultural barriers that limit their participation in mainstream and digital economies. These include restricted access to financial capital, limited digital literacy, reduced mobility and gender-based constraints in decision-making. As a result, their integration into digital entrepreneurial ecosystems remains uneven despite increasing global emphasis on digital inclusion.

Digital Transformation in the Indian Context: In India, national initiatives such as Digital India, Startup India and MSME development programs have significantly promoted digital adoption across sectors. These policies aim to improve digital infrastructure, enhance connectivity and encourage technology-driven entrepreneurship. However, the impact of these initiatives is not uniform across



regions or demographic groups. Urban entrepreneurs have benefited more rapidly from digital ecosystems, while rural and semi-rural women entrepreneurs continue to face barriers related to infrastructure, affordability and digital skills. This has contributed to a persistent digital divide within the entrepreneurial landscape.

Regional Context (Punjab and the Doaba Region): Punjab represents a diverse socio-economic environment characterized by agriculture, small-scale industries and growing entrepreneurial activity. Within Punjab, the Doaba region comprising districts such as Jalandhar, Hoshiarpur, Kapurthala and Shaheed Bhagat Singh Nagar exhibits a unique blend of rural and semi-urban economic structures. Although the region benefits from relatively higher educational attainment and migration-linked exposure, women entrepreneurs still face limitations in accessing digital infrastructure, formal training and technology-driven business platforms. The rural-urban divide within the region further intensifies disparities in digital adoption and entrepreneurial development.

2. RESEARCH GAP

Existing literature on digital transformation and women entrepreneurship is extensive but fragmented. Most studies focus separately on technological adoption, entrepreneurial challenges or gender-based constraints, without integrating these dimensions into a unified analytical framework. Furthermore, there is limited systematic evidence specifically focusing on the Doaba region of Punjab. The absence of a structured synthesis of barriers and enablers in this context limits a comprehensive understanding of how digital transformation is adopted by women entrepreneurs at the regional level.

3. RESEARCH OBJECTIVE AND QUESTIONS

3.1 Objectives: To address this gap, the present study aims to systematically review and synthesize existing literature on digital transformation adoption among women entrepreneurs, with specific emphasis on identifying the key barriers and enablers in the Doaba region of Punjab, India.

3.2 Research Questions: The study is guided by the following research questions:

1. **RQ1:** What are the key barriers hindering digital transformation adoption among women entrepreneurs?
2. **RQ2:** What factors act as enablers facilitating digital transformation adoption among women entrepreneurs?



4. SIGNIFICANCE OF THE STUDY

By integrating fragmented evidence into a structured and systematic synthesis, this study provides a comprehensive understanding of digital transformation dynamics in a region -specific entrepreneurial context. The findings offer valuable insights for policymakers, development agencies and researchers to design targeted interventions that enhance digital inclusion and strengthen women -led entrepreneurial ecosystems in semi -rural regions like Doaba.

5. RESEARCH METHODOLOGY

5.1 Research Design: This study employs a systematic literature review (SLR) approach guided by the PRISMA 2020 framework to ensure methodological transparency, replicability and rigor. The SLR method is appropriate for synthesizing fragmented evidence on digital transformation adoption among women entrepreneurs and for identifying consistent patterns across diverse empirical and conceptual studies. The review focuses on extracting and integrating evidence related to barriers and enablers influencing adoption outcomes.

5.2 Data Sources: Relevant literature was retrieved from leading academic databases to ensure comprehensive and high -quality coverage. These included Scopus, Web of Science, ScienceDirect and SpringerLink. Google Scholar was used as a supplementary database to capture additional relevant studies that may not be indexed in primary databases. This multi -database strategy ensured broad coverage of peer -reviewed research in entrepreneurship and digital transformation domains.

5.3 Search Strategy: A structured keyword search was conducted using combinations of the following terms: “digital transformation,” “women entrepreneurship,” “digital adoption,” “barriers,” “enablers,” “India,” and “Punjab.” Boolean operators (AND/OR) were applied to refine the search and enhance relevance. The search strategy was designed to capture studies addressing technological, socio -economic and institutional dimensions of digital adoption in entrepreneurial contexts.

A. Inclusion Criteria: Studies were included based on the following criteria:

- Peer -reviewed journal articles only,
- Published in the English language,
- Focused on women entrepreneurship and digital transformation or adoption and
- Published within the period 2010–2026 to ensure relevance to contemporary digital ecosystems and policy developments.

B. Exclusion Criteria: Studies were excluded if they were non-academic sources such as reports, blogs, conference abstracts without full papers or opinion-based articles. Duplicate records across databases were removed. Studies not directly addressing digital transformation in relation to women entrepreneurship were also excluded to maintain thematic precision and analytical clarity.

5.4 Screening Process: The study selection followed a structured PRISMA flow consisting of four stages: identification, screening, eligibility and inclusion. Initially, records were identified through database searches. In the screening stage, titles and abstracts were reviewed to remove irrelevant studies. Full-text articles were then assessed for eligibility based on inclusion criteria. Finally, only studies meeting all criteria were included in the synthesis. A PRISMA flow diagram was used to ensure transparency in reporting the selection process.

5.5 Data Extraction and Synthesis: A structured data extraction framework was developed to ensure consistency and comparability across studies. Key information extracted included author(s) and year, research methodology, study focus, key findings, identified barriers and identified enablers. The extracted data were systematically organized and synthesized to identify recurring patterns across the literature.

Table No.:5.1 Presents the Structured Synthesis of Included Studies.

Author(s) & Year	Methodology Type	Study Focus	Main Findings	Barriers	Enablers
Abdullah et al. (2025)	SLR	Women digital entrepreneurship	Digital platforms support business expansion but structural constraints persist	Gender norms, limited access	Digital platforms, policy support
Taheri (2024)	SLR	Digitalization in women entrepreneurship	Digital tools enhance participation and sustainability	Social constraints, inequality	Digital tools, online ecosystems
Sowmya & Pai (2024)	Empirical (AHP)	Digital inclusion	Digital literacy and finance are key determinants	Low literacy, financial barriers	Government schemes, inclusion support
Singh et	Qualitative	Informal	Digital adaptation	Socio -	Family support,



al. (2023)		entrepreneurship	through informal strategies	cultural barriers	learning attitude
Pandey (2026)	SLR	MSME digital transformation	Capability alignment drives adoption success	Capability gaps, finance issues	Institutional support, policy frameworks
Dale & Saha (2023)	Bibliometric + SLR	Digital entrepreneurship strategy	Fragmented research landscape	Gender bias, weak support systems	Networking, skill development
Lokuge & Duan (2023)	SLR	SME digital transformation	Adoption depends on internal and external readiness	Capability gaps	Ecosystem readiness
Egodawele et al. (2022)	SLR	Digital transformation theory	Need for unified conceptual models	Conceptual fragmentation	Integrated frameworks

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SLR – Systematic Literature Review
 AHP – Analytical Hierarchy Process
 Qualitative – Qualitative Research Method
 Bibliometric – Bibliometric Analysis

5.6 Data Analysis Method: The extracted data were analyzed using thematic synthesis. These involved three stages:

- Open coding to identify initial concepts.
- Axial coding to group related concepts.
- Thematic development to generate higher -order categories.

This approach enabled classification of findings into two primary domains:

- Barriers to digital transformation adoption.
- Enablers of digital transformation adoption among women entrepreneurs.

The synthesized themes provide a structured foundation for interpreting adoption dynamics in the Doaba region context.



6. RESULTS (THEMATIC ANALYSIS)

The systematic review included a carefully screened set of peer-reviewed studies focusing on digital transformation and women entrepreneurship. The selected literature reflects a growing but still fragmented research base on digital adoption in entrepreneurial contexts, particularly in developing economies. Most studies are concentrated between 2018 and 2026, indicating a recent surge in academic interest aligned with rapid digitalization trends. Methodologically, the included studies comprise systematic reviews, qualitative investigations and mixed-method approaches, reflecting diverse analytical perspectives. Overall, the evidence base highlights increasing attention to both technological and socio-economic dimensions of digital transformation among women entrepreneurs.

A. Barriers to Digital Transformation

1. Theme 1: Technological Barriers: A major barrier identified across the literature is limited digital literacy among women entrepreneurs. Many lack the technical skills required to effectively use digital platforms for business operations. Additionally, inadequate access to reliable internet connectivity, digital devices and modern tools further restricts their ability to engage in digital ecosystems.
2. Theme 2: Economic Barriers: Financial constraints significantly hinder digital adoption. The cost of acquiring devices, software and internet services remains prohibitive for many women-led micro and small enterprises. Limited access to credit and financial resources further exacerbates this challenge, reducing investment in digital infrastructure.
3. Theme 3: Socio-Cultural Barriers: Socio-cultural norms continue to play a restrictive role in shaping women's entrepreneurial behavior. Gender-based expectations, household responsibilities and limited autonomy in decision-making reduce their ability to independently adopt and utilize digital technologies. In several contexts, societal perceptions of women's entrepreneurship further limit digital engagement.
4. Theme 4: Institutional Barriers: Institutional constraints also emerge as a significant challenge. Weak implementation of training programs, insufficient institutional support and limited outreach of government initiatives reduce awareness and accessibility of digital empowerment schemes. Policy gaps and uneven execution at the grassroots level further weaken adoption outcomes.

B. Enablers of Digital Transformation

1. Theme 1: Government Support: Government initiatives such as digital literacy programs, entrepreneurship schemes and national-level missions like Digital India play a crucial role in



facilitating digital adoption. These programs enhance awareness, provide financial assistance and promote inclusion in digital ecosystems.

2. Theme 2: Digital Infrastructure: Improved mobile penetration and expanding internet connectivity have significantly contributed to enabling digital transformation. The increasing affordability of smartphones and data services has lowered entry barriers for women entrepreneurs to access digital platforms.
3. Theme 3: Skill Development: Entrepreneurship training programs and digital literacy initiatives serve as key enablers. Such programs enhance technical competencies, improve confidence in using digital tools and support the transition from traditional to digital business models.
4. Theme 4: Social Ecosystem Support: Non-governmental organizations (NGOs), self-help groups (SHGs) and local community networks provide essential social and institutional support. These networks facilitate knowledge sharing, peer learning and collective empowerment, thereby strengthening digital adoption capacity among women entrepreneurs.

Doaba Region: The Doaba region reflects a mixed entrepreneurial environment characterized by both opportunity and constraint. While increasing connectivity and educational awareness support gradual digital adoption, rural areas continue to face infrastructural limitations and lower digital readiness. A clear rural–urban divide exists, where urban women entrepreneurs demonstrate relatively higher engagement with digital platforms compared to their rural counterparts. Overall, the regional context highlights persistent digital inequality influenced by socio-economic and infrastructural disparities, which directly impact the pace and extent of digital transformation among women entrepreneurs.

7. DISCUSSION ON FINDINGS

The findings of this systematic review indicate that digital transformation adoption among women entrepreneurs is shaped by a complex interaction between barriers and enablers rather than isolated factors. Technological limitations, economic constraints, socio-cultural restrictions and institutional weaknesses collectively reduce the pace of adoption. However, these barriers are simultaneously counterbalanced by enabling forces such as government initiatives, improved digital infrastructure, skill development programs and supportive social ecosystems. This interaction suggests that adoption is not a linear process but a dynamic outcome influenced by the relative strength of constraints and support mechanisms within a given context.

- **Theoretical Connection:** The findings align with the Technology Acceptance Model (TAM), which explains technology adoption through perceived usefulness and perceived ease of use. In the context



of women entrepreneurs, low digital literacy and infrastructural gaps reduce perceived ease of use, thereby limiting adoption. Similarly, the Diffusion of Innovation Theory provides a useful lens to understand how digital technologies spread unevenly across social systems. Early adoption is often facilitated by access to resources and social networks, while late adoption is associated with structural and socio-cultural constraints. Together, these theories help explain the uneven and gradual nature of digital transformation in the studied context.

- **Policy Implications:** The study highlights the need for targeted policy interventions to accelerate digital inclusion among women entrepreneurs. Strengthening digital training programs at the grassroots level can directly address skill gaps and improve confidence in technology usage. Additionally, improving rural digital infrastructure, particularly internet connectivity and access to affordable digital devices, is essential for reducing regional disparities. Policies should also focus on ensuring effective implementation of existing schemes to bridge the gap between policy design and real-world impact.
- **Academic Contribution:** This study contributes to the literature by providing a region-specific synthesis of digital transformation adoption among women entrepreneurs in the Doaba region of Punjab. Unlike fragmented studies, it integrates barriers and enablers into a unified analytical framework, offering a more holistic understanding of adoption dynamics. The study also extends existing theoretical applications by contextualizing TAM and Diffusion of Innovation Theory within a semi-rural Indian entrepreneurial ecosystem, thereby adding empirical depth to existing knowledge.

8. CONCLUSION

This systematic review examined the adoption of digital transformation among women entrepreneurs in the Doaba region of Punjab, India, with a focus on identifying key barriers and enablers. The findings reveal that digital adoption is influenced by a combination of technological, economic, socio-cultural and institutional barriers that collectively limit effective participation in digital ecosystems. At the same time, enabling factors such as government initiatives, improving digital infrastructure, skill development programs and social support networks play a critical role in facilitating gradual digital integration. The study highlights that inclusive digital transformation is essential for strengthening women's entrepreneurial participation and enhancing their competitiveness in evolving markets. However, persistent regional disparities and structural constraints continue to slow down equitable adoption. To address these challenges, targeted and context-specific policy interventions are required, particularly those focused on enhancing digital literacy, improving rural connectivity and ensuring effective implementation of support schemes. Strengthening these areas can contribute to a more inclusive and



balanced digital entrepreneurial ecosystem in regions like Doaba, ultimately supporting sustainable women-led economic development.

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