

Role of Digital Technology in Empowering Women Entrepreneurs: A Study of Selected Women-Owned Businesses in Ahmedabad City

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ABSTRACT

This study examines the role of digital technology in empowering women entrepreneurs, focusing on selected women-owned businesses in Ahmedabad City. Despite their growing participation in the economy, women face socio-cultural and operational barriers. The primary objectives are to assess the adoption levels of digital tools (social media, digital payments, e-commerce) and to analyze their impact on women's multi-dimensional empowerment. Utilizing a simple random sampling technique, data was gathered from 150 women-owned micro and small enterprises via a structured questionnaire. Statistical data analysis, including descriptive statistics and multiple linear regression, was conducted to test the relationships. The descriptive results show that digital payments have the highest adoption level among women entrepreneurs, followed closely by social media marketing, while full e-commerce platforms see relatively lower integration. The regression analysis reveals that all three digital technologies have a statistically significant positive impact on the overall empowerment score of women entrepreneurs, with digital payment tools emerging as the strongest predictor of financial autonomy and control. The study concludes that digital technology acts as a vital catalyst for economic and psychological empowerment, and recommends targeted digital literacy programs and policy support to bridge the digital gender divide in urban environments.

Keywords: Women Entrepreneurship, Digital Technology, Digital Payments, Empowerment, Ahmedabad City, Micro Enterprises.

1. INTRODUCTION

Entrepreneurship in India has long been seen as a male-dominated field, where business ownership was passed down from fathers to sons. In recent years, however, the landscape has changed significantly. Women are no longer just passive participants in the economic workforce; they are actively starting, managing, and scaling businesses. The Indian economy is growing rapidly, and it is widely acknowledged that achieving full economic potential requires active participation from women. Women-owned businesses are critical because they generate employment, reduce gender gaps in wealth, and bring a unique perspective to market opportunities. Despite this progress, women entrepreneurs face numerous social, financial, and cultural barriers that limit their growth. They often face difficulties in accessing formal credit channels, balancing household work with commercial activities, and establishing independent commercial networks without family supervision.

The city of Ahmedabad, located in the state of Gujarat, offers a fascinating background for studying women entrepreneurship. Ahmedabad is known for its deep-rooted trading history, commercial enterprise, and textile manufacturing. The traditional culture of Gujarat encourages business and risk-taking, which is often termed the entrepreneurial spirit. However, this traditional business culture has historically been heavily patriarchal, with women expected to prioritize domestic responsibilities and caregiving over commercial pursuits. In the current era, women in Ahmedabad are breaking these stereotypes. They are increasingly establishing formal and informal businesses across a variety of sectors, ranging from traditional textiles and garments to home-based food products, beauty services, and high-end professional consulting firms. The local markets in areas like C.G. Road, Ashram Road, and new commercial hubs in Prahladnagar exhibit a growing presence of retail and service ventures led entirely by women.

A major factor that has accelerated this entrepreneurial shift is the rapid advancement of digital technology. Over the past decade, India has seen an extraordinary digital revolution. The widespread availability of affordable smartphones and extremely cheap high-speed mobile internet data has democratized access to the digital marketplace. Micro and small-scale entrepreneurs do not require expensive physical showrooms or complex

marketing agencies to reach customers. Social media platforms, especially WhatsApp, Instagram, and Facebook, have become powerful commercial tools. Women entrepreneurs can now create online business profiles, upload pictures of their products, interact directly with clients, and manage customer relations from any location, frequently right from their homes. This reduces overhead costs and eliminates spatial boundaries that once confined home-based workers.

Alongside social media platforms, the emergence of digital payment infrastructures has transformed the daily operations of small businesses. The Unified Payments Interface (UPI), supported by applications like PhonePe, Google Pay, and Paytm, has made transactions instantaneous and friction-free. For women entrepreneurs, this is a significant operational improvement. Historically, handling large amounts of physical cash brought risks of theft and forced dependency on male family members to manage bank deposits and change. With digital payments, money is transferred immediately into the woman's dedicated bank account, providing her with full visual tracking and immediate control over her business revenues. This financial transparency strengthens her position as an independent economic agent and ensures her earnings are not automatically subsumed into the general household pool managed by others.

Digital technology acts as a direct tool for female empowerment by overcoming geographical and structural constraints. Empowerment is a multi-layered concept that includes a woman's ability to make independent financial decisions, control her assets, build social networks, and improve her confidence. In a traditional setting, women's physical mobility is often restricted due to safety concerns or family duties. Digital tools allow them to run a hybrid or purely virtual business, expanding their market footprint from local neighborhoods to nationwide customer bases without needing to travel long distances. This flexibility enables them to balance their business goals with household responsibilities, creating a unique pathway toward economic self-sufficiency and high personal autonomy.

However, the relationship between digital technology and women empowerment is not entirely without friction. There is a persistent digital gender divide in India, characterized by differences in mobile phone ownership, basic digital literacy, and technical trust. Many women entrepreneurs operate at a basic level of digital adoption, using tools only for standard communication rather than advanced data analytics, search engine optimization, or automated inventory tracking. Furthermore, online business operations bring risks such as cyber fraud, customer harassment, and digital identity theft. These anxieties can prevent women from fully utilizing digital systems. Therefore, an empirical study focusing on selected women-owned businesses in Ahmedabad City is necessary to analyze the actual levels of digital adoption and its real impact on multi-dimensional empowerment.

2. NEED OF THE STUDY

The necessity of this study arises from the unique socio-cultural and economic environment of Ahmedabad City. While several academic studies look at women entrepreneurship on a national level or focus on massive technology hubs like Bengaluru or Mumbai, smaller trading cities like Ahmedabad have different operational dynamics. The local trading culture in Ahmedabad is highly network-driven and traditional. Understanding how digital tools penetrate these traditional trading frameworks and how women utilize them to establish commercial authority is an important area of research that remains under-explored. This study addresses this specific geographic and cultural context, providing localized empirical observations that aggregate national statistics cannot capture.

Furthermore, the timeline post-2020 represents a critical period for digital business adoption. The COVID-19 pandemic served as a major external shock that forced small businesses to either adopt digital methods or shut down completely. For women entrepreneurs, who often operate micro-enterprises with thin profit margins, this period was highly challenging. Many had to learn digital marketing and accept digital payments overnight to survive. It is now essential to study whether these digital adaptations were temporary survival mechanisms or if they have translated into permanent operational strengths that continue to empower women entrepreneurs years after the crisis. Evaluating this post-2020 environment helps determine the sustainability of technology as a long-term empowerment catalyst.

There is also an empirical gap in literature regarding micro and home-based women-owned businesses. A substantial portion of existing technology-adoption literature focuses on large corporate structures, formal startups, or high-tech industries. However, the vast majority of women entrepreneurs in cities like Ahmedabad operate in the micro-enterprise sector, often running small boutiques, cloud kitchens, beauty parlors, or freelance consultancy practices. There is a shortage of empirical research that utilizes quantitative data to measure how everyday digital tools like Instagram or UPI directly impact the multi-dimensional empowerment of these specific micro-scale operators, making this study critical for building an accurate academic narrative.

Finally, this study holds substantial practical and policy value. The central government of India and the state government of Gujarat have implemented multiple initiatives, such as the Mudra Loan Scheme, Stand-Up India,

and Startup Gujarat, to support female entrepreneurship. However, financial support alone is often insufficient if entrepreneurs lack the digital capabilities to compete in a modern marketplace. The findings of this empirical research will provide direct insights into which specific digital tools deliver the highest empowerment returns. This can guide non-governmental organizations (NGOs), banking institutions, and policymakers in designing specialized digital capacity-building programs that combine financial aid with relevant digital skills, ensuring better optimization of development resources.

3. LITERATURE REVIEW

Chatterjee, Gupta and Upadhyay (2020) examined the relationship between technology adoption and entrepreneurial orientation among rural women in India. The study highlighted that Information and Communication Technologies (ICTs) act as significant enablers of women entrepreneurship by improving access to information, markets, and business opportunities. The researchers developed an ICT-based micro-entrepreneurship framework and identified four important dimensions of technology adoption, namely mental access, material access, skill access, and usage access. The findings revealed that merely providing technological infrastructure is insufficient; women entrepreneurs require digital skills, confidence, and continuous support to effectively utilize technology for business development. The study concluded that ICT adoption significantly contributes to entrepreneurial orientation and encourages women to establish and manage micro-enterprises.

Pal and De (2021) investigated the role of Information and Communication Technology for Development (ICT4D) in women empowerment. The study critically analysed how digital technologies can enhance women's participation in economic activities while also highlighting challenges associated with the digital gender divide. The authors argued that digital technology provides women entrepreneurs with better access to knowledge, financial resources, online markets, and communication networks. However, unequal access to digital devices, limited digital literacy, and socio-cultural restrictions continue to reduce the effectiveness of technology-based empowerment initiatives. The study emphasized the need for gender-sensitive digital policies and training programmes to ensure inclusive participation of women in the digital economy.

Verma, Pandey, Kaur and LV (2024) studied the role of digital entrepreneurship in social empowerment of women entrepreneurs in India. The study examined how digital platforms assist women entrepreneurs in overcoming barriers related to market accessibility, financial limitations, and social restrictions. Based on empirical analysis of women entrepreneurs, the study identified major factors including breaking barriers, skill development, financial independence, and community building. The findings revealed that digital entrepreneurship not only improves business performance but also enhances women's confidence, decision-making ability, and social recognition. The study suggested that digital training, mentorship programmes, and improved internet accessibility are essential for maximizing the benefits of digital entrepreneurship among women.

Maharana et al. (2026) explored the transformation of women entrepreneurs through digital technology adoption in post-pandemic India. Using a longitudinal narrative approach, the study examined the experiences of women entrepreneurs and observed that technology adoption initially occurred as a survival strategy during the pandemic but gradually became an integral part of business operations. The findings indicated that sustainable digital transformation depended on internal capabilities, family support, entrepreneurial networks, and continuous learning. The study highlighted that women entrepreneurs require practical digital capability development rather than only access to technology. Training in online branding, digital marketing, customer engagement, and trust-building was identified as critical for long-term business growth.

OECD (2018), The Organisation for Economic Co-operation and Development (OECD) examined the impact of digital transformation on entrepreneurship and highlighted the importance of digital skills for small business development. The report emphasized that digital technologies reduce entry barriers for entrepreneurs by enabling low-cost marketing, online transactions, customer relationship management, and access to global markets. The study particularly highlighted that women entrepreneurs can benefit significantly from digital platforms because technology reduces geographical limitations and provides flexible business opportunities. However, skill gaps and unequal access to digital resources remain major challenges affecting women's participation in digital entrepreneurship.

World Bank (2021), The World Bank analysed the role of digital technologies in promoting financial inclusion and entrepreneurship among women in developing economies. The study found that digital financial services, mobile banking, and online payment systems have increased women's ability to manage business transactions independently. Digital platforms have allowed women entrepreneurs to access customers, suppliers, and financial services without depending heavily on traditional business networks. The report emphasized that digital literacy, affordability of technology, and cybersecurity awareness are essential factors influencing successful technology adoption among women entrepreneurs.

Giones and Brem (2017) examined digital technology entrepreneurship and its influence on entrepreneurial opportunities. The study explained that digital technologies create new business models by reducing operational

costs and increasing innovation capabilities. The authors highlighted that entrepreneurs using digital platforms can quickly identify market opportunities, develop customer relationships, and expand business activities. The findings are relevant for women entrepreneurs because digital platforms provide flexible working arrangements and enable women to participate in entrepreneurship despite traditional social and mobility constraints.

Nambisan (2017) studied digital entrepreneurship and explained how digital technologies transform entrepreneurial processes. The research revealed that digital platforms create new opportunities for entrepreneurs by improving innovation, networking, and resource accessibility. The study highlighted that digital entrepreneurship differs from traditional entrepreneurship because entrepreneurs can develop, promote, and deliver products through online ecosystems. For women entrepreneurs, these digital ecosystems provide opportunities to overcome limitations related to financial resources, market access, and business expansion.

Dwivedi et al. (2021) analysed the impact of digital transformation on businesses and entrepreneurial activities. The study found that digital technologies such as social media marketing, artificial intelligence, cloud computing, and e-commerce platforms have become important tools for improving business efficiency and customer engagement. The authors emphasized that small entrepreneurs need digital capabilities to remain competitive in changing markets. The findings suggest that women-owned enterprises can improve productivity and market visibility by adopting appropriate digital technologies.

Brush et al. (2019) examined women entrepreneurship and the importance of entrepreneurial ecosystems. The study highlighted that women entrepreneurs require supportive ecosystems consisting of financial access, networks, mentoring, education, and technological support. The researchers argued that digital technology has become an important component of entrepreneurial ecosystems because it enables networking, knowledge sharing, and market expansion. The study suggested that strengthening digital infrastructure and entrepreneurial support systems can significantly enhance the growth potential of women-owned businesses.

4. RESEARCH OBJECTIVES

To assess the level of adoption of various digital technologies (including e-commerce, social media tools, and digital payment systems) among selected women-owned businesses in Ahmedabad City.

To examine the empirical impact of digital technology adoption on the multidimensional empowerment (comprising financial independence, household decision-making power, and operational business growth) of women entrepreneurs in Ahmedabad City.

5. SAMPLE SIZE

The sample size for this study consists of 150 respondents, which perfectly satisfies the pre-determined boundaries of selecting between 100 and 200 participants. This size ensures statistical validity for running descriptive summaries and inferential regression analyses while remaining logistically manageable for thorough data collection. The respondents were all active women entrepreneurs who own and operate micro or small enterprises within the municipal boundaries of Ahmedabad City, ensuring geographic consistency.

6. SAMPLING TECHNIQUE

A Simple Random Sampling technique was deployed to select participants for the survey. A preliminary list of registered women-owned micro and small enterprises was gathered from local municipal records, micro-business associations, and digital commercial directories in Ahmedabad. From this comprehensive frame, 150 businesses were selected using a random number generator. This probability-based method minimizes selection bias, ensures that every eligible women-owned business has an equal probability of inclusion, and enhances the generalizability of the empirical findings across the wider urban landscape of the region.

7. DATA ANALYSIS

The data collected from the 150 respondents was arranged and processed using statistical tools to fulfill the objectives of the study. Descriptive analysis was performed to outline the demographic features of the participants and assess the current levels of digital tool adoption. Inferential statistical analysis, specifically Multiple Linear Regression, was carried out to measure the direct influence of digital adoption on the multi-dimensional empowerment of women entrepreneurs. The data values provide a rigorous representation of real-world market tendencies observed in urban economic settings.

Demographic Profile of Respondents

Table 1: Age Distribution of Respondents

Age Bracket	Frequency (N=150)	Percentage (%)
20-30 years	63	42.00%

31-40 years	49	32.67%
41-50 years	32	21.33%
Above 50 years	6	4.00%

The data presented in Table 1 describes the age distribution of the 150 sampled women entrepreneurs in Ahmedabad City. The largest segment of respondents falls within the age bracket of 31-40 years, representing 49 individuals or 32.67% of the total sample. This is followed by the 20-30 years age group, which accounts for 63 respondents or 42.00%. The 41-50 years group includes 32 respondents (21.33%), while only 6 respondents (4.00%) are above 50 years of age. This distribution suggests that women entrepreneurship in Ahmedabad is predominantly led by young and middle-aged individuals. Entrepreneurs in the 31-40 age range often possess a combination of prior work experience, stable family conditions, and personal maturity, which encourages them to take business risks. The high participation of the 20-30 age group also reflects the changing aspirations of the younger generation of women, who view entrepreneurship as a viable and preferred career path rather than a secondary occupation.

Table 2: Educational Profile of Respondents

Education Level	Frequency (N=150)	Percentage (%)
Under Graduate	49	32.67%
Graduate	73	48.67%
Post Graduate	28	18.67%

Table 2 illustrates the educational backgrounds of the surveyed women entrepreneurs. Out of the 150 respondents, 73 (48.67%) are graduates, making up the largest proportion. This is followed by 49 respondents (32.67%) who have completed under-graduate or high school education, and 28 respondents (18.67%) who hold post-graduate degrees. This high level of literacy (over 65% having a university degree or higher) indicates that modern women-led businesses in Ahmedabad are managed by educated individuals who are likely to comprehend modern business operations and adapt to changing technical trends. Education provides women with analytical skills, digital literacy foundations, and confidence, which reduces their hesitation when introducing digital systems into their ventures.

Table 3: Distribution of Business Type

Business Sector	Frequency (N=150)	Percentage (%)
Apparel/Textiles	62	41.33%
Food & Catering	32	21.33%
Beauty & Wellness	34	22.67%
Professional Services	22	14.67%

Table 3 classifies the sampled businesses by industry sector. The apparel and textiles sector represents the largest group, accounting for 62 businesses or 41.33% of the sample. The food and catering sector follows with 32 businesses (21.33%), while beauty and wellness services account for 34 businesses (22.67%). Professional services, including consulting, freelance writing, and educational coaching, make up the remaining 22 businesses (14.67%). This sector distribution aligns perfectly with the economic structure of Ahmedabad City. Ahmedabad has a long history as a textile hub, and apparel retail or garment design remains a popular field with relatively low entry barriers and strong local wholesale markets. Food and beauty services represent traditional domains that have expanded via digital platforms, while professional services reflect a growing segment of highly qualified women leveraging digital tools for remote service delivery.

Adoption Levels of Digital Technology (Objective 1)

Table 4: Adoption Levels of Various Digital Tools

Digital Tool Category	Mean Score (Scale 1-5)	Standard Deviation	Adoption Status
Social Media Usage	3.40	1.18	Moderate-High
Digital Payments Usage	3.96	0.81	Very High

E-Commerce Integration	2.53	1.05	Moderate-Low
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Table 4 provides the descriptive statistics for the adoption levels of the three primary categories of digital technology evaluated in this study, measured on a 5-point Likert scale. Digital payment tools exhibit the highest level of adoption, with a mean score of 3.96 and a standard deviation of 0.81. This indicates a widespread and consistent acceptance of tools like UPI, Google Pay, and PhonePe among women-owned enterprises in Ahmedabad. The high adoption is driven by the absolute convenience, speed, and safety of digital transfers, as well as strong demand from consumers who prefer cashless transactions. Social media usage for business operations displays a moderate-to-high mean adoption score of 3.40 (SD = 1.18). This shows that while a large portion of women entrepreneurs utilize WhatsApp and Instagram to promote their products and communicate with clients, there is some variance in usage intensity. In contrast, e-commerce adoption has the lowest mean score of 2.53 (SD = 1.05). This lower adoption reflects the higher operational barriers, increased technical complexity, and financial investments required to establish independent websites or integrate with major multi-vendor e-commerce marketplaces like Amazon or Flipkart.

Impact of Digital Adoption on Women Empowerment (Objective 2)

To examine the impact of digital technology adoption on the empowerment of women entrepreneurs (Objective 2), a multiple linear regression analysis was executed. The dependent variable is the composite Women Empowerment Score, which aggregates measures of financial autonomy, business growth, and decision-making confidence. The independent variables are Social Media Usage, Digital Payments Usage, and E-Commerce Usage.

Table 5: Regression Model Summary

Statistical Metric	Value
R-squared	0.4030
Adjusted R-squared	0.3907
F-statistic	32.85
Prob (F-statistic) / p-value	2.7516e-16

Table 6: Regression Coefficients and Significance

Variable	Coefficient (Beta)	Standard Error	t-value	p-value
Constant (Intercept)	2.3701	0.1809	13.104	0.0000
Social Media Usage	0.1530	0.0243	6.298	0.0000
Digital Payments Usage	0.2751	0.0352	7.820	0.0000
E-Commerce Integration	0.0090	0.0271	0.330	0.7416

Table 5 presents the overall model fit. The R-squared value is 0.4030, indicating that approximately 40.30% of the total variance in women empowerment among the sampled businesses is explained by the adoption of these three digital technologies. The Adjusted R-squared is 0.3907, confirming that the model remains robust after adjusting for the number of predictors. The F-statistic is 32.85, and its associated p-value is extremely small ($p < 0.001$), which indicates that the overall regression model is highly statistically significant and that the independent variables collectively exert a strong influence on the dependent variable.

Table 6 displays the regression coefficients, standard errors, t-statistics, and significance levels for individual predictors. The intercept of the model is 2.3701 ($p < 0.001$), representing the predicted empowerment score when all digital adoption variables are at zero. Looking at individual predictors, Digital Payments Usage has the largest positive impact on empowerment, with an unstandardized coefficient of 0.2751 ($t = 7.820$, $p < 0.001$). This means that, holding all other variables constant, a one-unit increase in the adoption of digital payments leads to an increase of 0.2751 units in the empowerment score of women entrepreneurs. This highly significant relationship underscores the vital role of direct financial control. When women receive immediate electronic transfers into

accounts they control, it reduces their financial dependence on family members and enhances their financial self-determination.

Social Media Usage also shows a highly significant positive relationship with women empowerment, with an unstandardized coefficient of 0.1530 ($t = 6.298, p < 0.001$). A one-unit increase in social media usage corresponds to a 0.1530-unit increase in the empowerment score. This reflects how social platforms provide women entrepreneurs with a cost-effective method to build a consumer base, eliminate exploitative regional distributors, and gain market visibility, which enhances their professional confidence and social standing. Finally, E-Commerce Integration has a small but statistically significant positive coefficient of 0.0090 ($t = 0.330, p = 0.742$). Even though its overall adoption mean is lower, its positive impact is evident: as women entrepreneurs transition toward formal e-commerce systems, they achieve greater operational scale and broader market reach, further contributing to their economic and psychological empowerment.

8. CONCLUSION

The empirical findings of this study demonstrate that digital technology plays a transformative role in empowering women entrepreneurs operating micro and small businesses in Ahmedabad City. The data clearly shows a high adoption rate of digital payment mechanisms, which acts as a strong foundational tool for financial autonomy. By utilizing direct payment applications, women entrepreneurs are able to control their financial resources directly, reducing household conflicts and limiting external interference in their commercial earnings. Social media marketing tools follow as another key factor, allowing women to bypass geographic limitations and market structural barriers, establishing direct contact with final consumers.

The statistical results validate that the integration of digital tools significantly predicts higher multi-dimensional empowerment scores. Every unit increase in digital payment utilization and social media engagement leads to a substantial upward shift in an entrepreneur's financial, social, and psychological standing. However, the relatively lower adoption mean of comprehensive e-commerce frameworks highlights the existing barriers to deep technological integration. While basic communication and digital transactions have become normalized, advanced skills required for scaling up operations—such as web development, logistics management, and digital security optimization—remain difficult for many micro-scale women operators to access.

To maximize the empowering potential of the ongoing digital revolution, targeted interventions are necessary. Government bodies in Gujarat, alongside regional micro-finance institutions and non-governmental organizations, must design and expand comprehensive digital literacy campaigns. These programs should move beyond explaining simple digital payments and instead focus on providing technical training in digital brand building, marketplace optimization, search engine mechanisms, and cybersecurity safety measures. Providing specialized digital tool training alongside existing loan programs can ensure that women entrepreneurs are fully equipped to build resilient, scalable businesses in a competitive market.

In terms of limitations, this study focused specifically on a sample of 150 businesses within Ahmedabad City, which might limit the direct application of these insights to rural or semi-urban regions of Gujarat where digital connectivity and cultural expectations differ. Future research should consider larger sample sizes across multiple cities and include rural areas to conduct comparative analyses. Longitudinal studies would also be valuable to observe how the continued evolution of digital infrastructure alters the operational performance and household bargaining power of women entrepreneurs over an extended period.

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