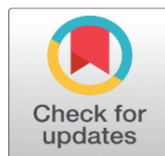
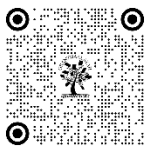


DIGITAL TRANSFORMATION AMONG WOMEN-LED MSMES DURING THE COVID-19 PANDEMIC IN KERALA

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ABSTRACT

The COVID-19 pandemic brought unprecedented challenges to businesses worldwide, particularly Micro, Small, and Medium Enterprises (MSMEs). Women-led MSMEs in Kerala faced unique hurdles due to limited resources, market disruptions, and societal norms. However, the crisis also catalyzed a significant shift towards digital transformation. This study explores the impact of digital adoption on women-led MSMEs during the pandemic, focusing on the challenges, opportunities, and strategies employed to ensure business continuity and growth. The research investigates the extent to which women entrepreneurs in Kerala integrated digital tools for marketing, operations, and customer engagement. It examines the role of government initiatives, technological advancements, and community support in facilitating this transition. Key areas of focus include e-commerce adoption, digital payment systems, and the use of social media for business promotion. The study also identifies barriers to digital transformation, such as inadequate digital literacy, financial constraints, and limited access to technology. Through a combination of qualitative and quantitative methods, the study reveals how digital transformation enabled women entrepreneurs to expand their market reach, improve operational efficiency, and enhance customer satisfaction despite the pandemic's economic challenges. It highlights inspiring success stories and best practices while addressing persistent challenges that require targeted interventions. The findings underline the critical role of digital transformation in fostering resilience and empowering women entrepreneurs in Kerala's MSME sector. The study offers policy recommendations to enhance digital literacy, improve access to technology, and provide financial incentives for digital adoption. By spotlighting the intersection of gender, technology, and entrepreneurship, this research contributes valuable insights into building a more inclusive and robust business ecosystem in the post-pandemic era. The target respondents for the study are the Women-Led MSMEs in Kerala. 110 people were chosen favourably for this investigation. Stratified random sampling was used to gather 110 respondents from Kerala in order to obtain the relevant data.

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Keywords: Micro, Small, and Medium Enterprises, Digital Adoption, Women Entrepreneurs

1. INTRODUCTION

The COVID-19 pandemic caused significant disruptions to businesses worldwide, with Micro, Small, and Medium Enterprises (MSMEs) being particularly vulnerable. In India, MSMEs account for a significant portion of economic

activity, employing over 110 million people and contributing nearly 30% to the GDP (Ministry of MSME, 2021). Kerala's MSME sector is a critical driver of regional development, with women entrepreneurs playing a substantial role in fostering socio-economic progress. However, the pandemic posed severe challenges, including disrupted supply chains, reduced consumer demand, and financial constraints, which disproportionately impacted women-led enterprises (Jha et al., 2021).

Amid these challenges, digital transformation emerged as a powerful enabler of resilience and recovery. The adoption of digital technologies such as e-commerce, digital payments, and online marketing allowed women-led MSMEs to pivot their operations, reach new customer bases, and sustain their businesses during periods of economic uncertainty (Sharma et al., 2022). This digital shift also presented opportunities for long-term growth, enhancing operational efficiency, market expansion, and customer engagement.

However, the transition to digital platforms was not seamless. Women entrepreneurs often faced barriers such as limited digital literacy, lack of financial resources, and restricted access to technological infrastructure. Socio-cultural norms further compounded these challenges, making it difficult for many women to navigate the digital landscape effectively (Kapur et al., 2020).

This study explores the impact of digital transformation on women-led MSMEs in Kerala during the COVID-19 pandemic, focusing on the challenges encountered, strategies adopted, and outcomes achieved. Drawing on empirical evidence and case studies, the research examines the role of government initiatives, private sector support, and community networks in enabling this transition. The findings aim to provide actionable insights for policymakers and stakeholders to create a more inclusive and digitally empowered entrepreneurial ecosystem in Kerala.

2. STATEMENT OF THE PROBLEM

The COVID-19 pandemic significantly disrupted women-led Micro, Small, and Medium Enterprises (MSMEs) in Kerala, posing challenges such as supply chain disruptions, financial constraints, and reduced market demand. While digital transformation emerged as a critical strategy to ensure business survival, many women entrepreneurs faced barriers like limited digital literacy, financial constraints, and restricted access to technology. Additionally, socio-cultural norms and increased household responsibilities during the pandemic compounded these challenges. Despite the growing adoption of e-commerce, digital payments, and online marketing, there is a lack of focused research on the extent and impact of digital transformation among women-led MSMEs in Kerala. This study investigates the challenges, strategies, and outcomes of digital adoption in this context, aiming to provide insights for fostering a more inclusive and resilient entrepreneurial ecosystem.

3. REVIEW OF LITERATURE

- **Sharma and Mehta (2023)** explored the impact of digital transformation on the resilience of women-led MSMEs during the COVID-19 pandemic. Their study highlights that adopting e-commerce platforms and social media marketing enabled businesses to sustain operations despite restrictions. The authors emphasized the importance of digital literacy training and financial support for women entrepreneurs, particularly in rural areas.
- **Brito and Felix (2023)** examined how digital technologies contributed to sustainability in women-led MSMEs. They found that technologies like blockchain and data analytics enhanced supply chain transparency and decision-making. These practices not only improved business efficiency but also aligned with sustainable development goals.
- **Agarwal et al. (2022)** identified significant barriers to digital adoption among women entrepreneurs, including limited access to technology, financial constraints, and socio-cultural norms. Their study underscores the importance of policy interventions to address these challenges, particularly through targeted programs promoting digital inclusion.

4. RESEARCH GAP

The research gap in digital transformation among women-led MSMEs during the COVID-19 pandemic includes a lack of studies on the long-term impacts of digital adoption on business sustainability and growth. While barriers such as

financial constraints, digital literacy, and socio-cultural norms are acknowledged (Agarwal et al., 2022), there is insufficient research on how these barriers vary regionally and culturally, especially in rural settings. Additionally, there is limited understanding of gender-specific challenges in digital literacy, and how policies and institutional support can better cater to women entrepreneurs (Sharma & Mehta, 2023). Moreover, more research is needed on integrating digital tools into traditional business models and exploring financial support mechanisms for women-led businesses.

4.1. OBJECTIVES OF THE STUDY

- To identify the key challenges faced by women entrepreneurs in adopting digital tools and technologies.
- To evaluate the impact of digital transformation on business sustainability, growth, and resilience.
- To explore the barriers related to digital literacy and technological access among women entrepreneurs in rural and urban areas of Kerala.

5. RESEARCH METHODOLOGY

Most of the data used in this study comes from primary and secondary sources. In the study region, at the sample respondents, primary data will be gathered. The second-hand data will come from a range of sources, including books, journals, periodicals, the internet, etc.

Target Respondents

The target respondents for the study are the Women-Led MSMEs in Kerala

Sample size

The sample size for the study is 110.

Sampling Method & Type

The sampling technique used in this study was Stratified random sampling method.

6. RSEULTS & DISCUSSION

- To identify the key challenges faced by women entrepreneurs in adopting digital tools and technologies.

CHALLENGES FACED BY WOMEN ENTREPRENEURS IN ADOPTING DIGITAL TOOLS AND TECHNOLOGIES

Women entrepreneurs face several challenges in adopting digital tools and technologies, which can hinder their ability to fully leverage digital transformation for business growth. These challenges are multifaceted, including limited access to financial resources, lack of digital literacy, and time constraints due to balancing business and family responsibilities. Additionally, the fear of technology, especially among those with limited technical knowledge, often prevents women from embracing digital tools. Moreover, inadequate access to mentorship, networking opportunities, and gender-sensitive policies further restrict their digital adoption. Addressing these challenges requires targeted interventions such as financial support, digital training, and inclusive policies to ensure women entrepreneurs can effectively harness the power of digital technologies.

CHALLENGES FACED BY WOMEN ENTREPRENEURS IN ADOPTING DIGITAL TOOLS AND TECHNOLOGIES

Table 1

Ranks		
Challenges	Mean Rank	Rank
Lack of Technical Support and Resources	7.09	II
Resistance to Change	6.07	III
Limited Networking Opportunities	5.05	V
Gender Bias and Discrimination	7.18	I
Complexity of Digital Tools	4.86	VI
Inadequate Financial Literacy	2.51	VIII
Time Constraints	5.35	IV

Cybersecurity Concerns	3.44	VII
Insufficient Government Support	3.44	VII
Test Statistics ^a		
N	110	
Chi-Square	1496.232	
df	8	
Asymp. Sig.	.000	
a. Friedman Test		

Source Computed Data

The above table shows that, the challenges faced by women entrepreneurs in adopting digital tools are ranked based on their significance. Gender bias and discrimination (mean rank = 7.18) is the most significant challenge, indicating that women face societal and institutional barriers that hinder their access to digital resources. Close behind is the lack of technical support and resources (mean rank = 7.09), highlighting the difficulty in finding affordable and adequate assistance to adopt digital tools. Resistance to change (mean rank = 6.07) reflects the hesitance many women experience in embracing new technologies due to fear or unfamiliarity. Time constraints (mean rank = 5.35) reveal the difficulty women face in balancing work and family responsibilities, limiting the time available for learning and digital adoption. Limited networking opportunities (mean rank = 5.05) point to the lack of access to professional networks for sharing best practices and receiving guidance. The complexity of digital tools, cybersecurity concerns, and insufficient government support are also significant barriers, as reflected in their lower ranks (mean ranks of 4.86, 3.44, and 3.44 respectively). The Friedman Test indicates that these challenges are statistically significant, showing that they affect women's ability to adopt digital tools effectively in their businesses.

The results from the Friedman Test confirm the significant impact of these challenges on women entrepreneurs. With a Chi-Square value of 1496.232 and an Asymp. Sig. value of 0.000, the statistical test supports the notion that these challenges are not random but have a meaningful impact on the adoption of digital tools. The low p-value (< 0.05) suggests that the identified challenges differ significantly from one another, emphasizing that each barrier, from gender bias to time constraints, plays a crucial role in hindering the digital transformation of women-led MSMEs.

To evaluate the impact of digital transformation on business sustainability, growth, and resilience.

7. IMPACT OF DIGITAL TRANSFORMATION

To test whether there is any significant difference in the impact of digital transformation on business sustainability, growth, and resilience, one sample 't' test has been applied and the result is shown in table 2.

Null Hypothesis (H₀): There is no significant difference in the impact of digital transformation on business sustainability, growth, and resilience among the respondents. The result of one- sample "t" test is given in table 2.

7.1. IMPACT OF DIGITAL TRANSFORMATION

Table 2

One-Sample Statistics				
Variables	N	Mean	Std. Deviation	Std. Error Mean
Impact of digital transformation	110	2.98	3.4891	.11258

Table 3

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper

Impact of digital transformation	149.234	109	.000*	32.84462	21.4104	22.2798
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Source: Computed Data

*Significant at 5 Percent Level

The relatively low mean of 2.98 combined with the high standard deviation implies that while the general view of the impact of digital transformation is somewhat neutral or slightly negative, there is considerable disagreement or variation in opinions among the respondents. Some respondents may feel that digital transformation has a significantly positive impact, while others might view it as less effective, contributing to the high variability.

To explore the barriers related to digital literacy and technological access among women entrepreneurs in rural and urban areas of Kerala.

8. BARRIERS RELATED TO DIGITAL LITERACY AND TECHNOLOGICAL ACCESS AMONG WOMEN ENTREPRENEURS IN RELATION TO THEIR RESIDENTIAL AREAS

The barriers to digital literacy and technological access among women entrepreneurs in both rural and urban areas of Kerala are multifaceted. While Kerala has made progress in digital adoption, many women face significant challenges that hinder their ability to fully engage with digital tools and technologies. These challenges include limited access to affordable digital resources, lack of relevant training, gender-based social norms, and poor internet connectivity, particularly in rural areas. Additionally, financial constraints and a lack of localized digital platforms further contribute to the digital divide. Addressing these barriers is crucial for empowering women entrepreneurs and enhancing their capacity to thrive in a digital economy.

Null Hypothesis (H0): There is no significant difference between barriers related to digital literacy and technological access among women entrepreneurs in relation to their residential areas of the respondents. The result of independent sample 't' test analysis is given in table 4.

BARRIERS RELATED TO DIGITAL LITERACY AND TECHNOLOGICAL ACCESS AMONG WOMEN ENTREPRENEURS IN RELATION TO THEIR RESIDENTIAL AREAS

Table 4

S.NO	BARRIERS	MEAN SCORE		t- STATISTICS	P- VALUE
		URBAN	RURAL		
1	Inadequate Digital Training Programs	4.03	3.37	4.489	.000*
2	Gender-Based Technological Divide	4.18	3.76	3.917	.000*
3	Connectivity Issues	3.95	3.69	2.958	.003*
4	Financial Constraints	3.88	3.43	2.792	.006*
5	Lack of Localized Digital Platforms	3.81	3.65	.957	.340
6	Cultural Barriers to Digital Engagement	4.29	4.32	-.253	.800
7	Limited Digital Literacy	4.07	3.31	5.206	.000*

Regarding the barriers related to digital literacy and technological access among women entrepreneurs in relation to their residential areas of the respondents, there is a significant differences had been identifies in the case of

“Inadequate Digital Training Programs” (.000), “Gender-Based Technological Divide”(.000), “Connectivity Issues” (.003), “Financial Constraints” (.006), “Limited Digital Literacy” (.000). since their ‘t’ statistics is significant at five percent level.

9. FINDINGS

- Gender bias and discrimination (mean rank = 7.18) is the most significant challenge, indicating that women face societal and institutional barriers that hinder their access to digital resources and the complexity of digital tools, cybersecurity concerns, and insufficient government support are also significant barriers, as reflected in their lower ranks (mean ranks of 4.86, 3.44, and 3.44 respectively)
- The impact of digital transformation is somewhat neutral or slightly negative, there is considerable disagreement or variation in opinions among the respondents. Some respondents may feel that digital transformation has a significantly positive impact, while others might view it as less effective, contributing to the high variability.
- Regarding the barriers related to digital literacy and technological access among women entrepreneurs in relation to their residential areas of the respondents, there is a significant differences had been identifies in the case of “Inadequate Digital Training Programs” (.000), “Gender-Based Technological Divide”(.000), “Connectivity Issues” (.003), “Financial Constraints” (.006), “Limited Digital Literacy” (.000). since their ‘t’ statistics is significant at five percent level.

10. SUGGESTIONS

- Offer basic digital training for women entrepreneurs to help them use online tools for marketing, sales, and business operations.
- Introduce subsidies or low-interest loans to help women entrepreneurs afford digital tools and technologies.
- Governments should create policies that make it easier for women entrepreneurs to access digital technologies and support their businesses' digital growth.
- Make sure that women-led MSMEs, especially in rural areas, have access to affordable internet and digital devices.
- Regularly track and evaluate the effects of digital adoption on business growth and sustainability to help guide future support.

11. CONCLUSION

In conclusion, the digital transformation of women-led MSMEs during the COVID-19 pandemic in Kerala has highlighted both the resilience and challenges faced by these businesses. Digital tools have played a pivotal role in helping women entrepreneurs sustain their operations, expand their market reach, and maintain customer engagement despite disruptions. Technologies such as e-commerce, social media, and digital payment systems have been particularly valuable for overcoming traditional barriers like limited market access and physical constraints. However, several barriers persist, including limited access to affordable technology, financial constraints, and gaps in digital literacy, especially in rural areas. The role of supportive government policies, financial incentives, and initiatives to enhance digital skills is crucial for addressing these challenges and enabling women-led MSMEs to thrive in a digital-first economy. To maximize the benefits of digital transformation, there is a need for continued focus on providing accessible training programs, expanding financial support, and fostering collaborative networks for women entrepreneurs. Moreover, long-term studies should be conducted to assess the lasting impacts of digital tools on business sustainability, growth, and resilience. In conclusion, while digital transformation presents significant opportunities for women-led MSMEs, targeted efforts to overcome existing barriers will be key to ensuring their continued success and growth in the future.

CONFLICT OF INTERESTS

None.

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