



Impact of Digital Financial Services on Financial Inclusion and MSME Performance: Evidence from Uttar Pradesh MSMEs

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Abstract

The rapid expansion of digital financial services (DFS) has transformed the financial landscape of India, particularly for Micro, Small, and Medium Enterprises (MSMEs). With initiatives supported by institutions such as the Reserve Bank of India and the National Payments Corporation of India, digital platforms including UPI, mobile banking, and fintech applications have significantly improved access to formal financial systems. This study examines the impact of Digital Financial Services on financial inclusion and MSME performance in the state of Uttar Pradesh.

Using primary data collected from MSME owners across selected districts of Uttar Pradesh, the study employs a quantitative research design to analyze the relationship between DFS adoption, financial inclusion indicators (access to credit, savings, digital transactions), and firm performance (sales growth, profitability, and operational efficiency). Statistical tools such as correlation and regression analysis are applied to test the proposed hypotheses.

The findings indicate that higher adoption of digital financial services significantly enhances financial inclusion among MSMEs. Furthermore, financial inclusion positively influences enterprise performance. The study also reveals a mediating role of financial inclusion in strengthening the relationship between DFS adoption and MSME performance. The results highlight the policy relevance

of digital financial ecosystems in promoting inclusive and sustainable business growth in emerging economies. The study contributes to the growing literature on fintech-driven financial inclusion and provides practical implications for policymakers, financial institutions, and MSME stakeholders in Uttar Pradesh and similar developing regions.

Keywords: Digital Financial Services, Financial Inclusion, MSME Performance, FinTech, Financial Access, Uttar Pradesh, Digital Payments; Sustainable Business Growth.



Introduction

Over the last decade, India has witnessed a remarkable transformation in its financial ecosystem driven by rapid digitalization. The expansion of digital infrastructure, government initiatives, and fintech innovations has significantly reshaped the way financial services are accessed and delivered. Digital Financial Services (DFS), including mobile banking, internet banking, digital wallets, and Unified Payments Interface (UPI), have emerged as powerful tools for enhancing financial accessibility and operational efficiency. Regulatory and institutional support from the Reserve Bank of India and technological facilitation by the National Payments Corporation of India have accelerated the adoption of digital payments and formal financial mechanisms across the country.

Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in India's economic development. As defined by the Ministry of Micro, Small and Medium Enterprises, the MSME sector contributes significantly to GDP, employment generation, exports, and regional development. Despite their economic importance, MSMEs have historically faced challenges such as limited access to formal credit, high transaction costs, information asymmetry, and dependence on informal financial sources. Financial exclusion has been one of the major constraints affecting their growth and sustainability.

The emergence of digital financial services has created new opportunities to bridge this gap. Digital platforms reduce transaction costs, improve transparency, enhance credit assessment through digital footprints, and enable easier integration into formal financial systems. In particular, digital payment systems such as UPI and Aadhaar enabled services have enabled small businesses to participate more actively in the formal economy. These developments have been especially significant in large and economically diverse states like Uttar Pradesh, where MSMEs represent a substantial share of regional economic activity.

Uttar Pradesh, being one of India's most populous states, has a vast network of MSMEs operating in manufacturing, trading, handicrafts, food processing, and service sectors. However, many enterprises in the state still face structural challenges related to financial inclusion, digital literacy, and access to institutional finance. While digital initiatives have expanded rapidly in urban centers, the extent to which DFS adoption has translated into measurable improvements in financial inclusion and enterprise performance remains an important empirical question.

Existing literature highlights that financial inclusion can positively influence firm performance by improving liquidity management, facilitating access to credit, enabling risk diversification, and supporting business expansion. Similarly, the adoption of digital financial technologies is often associated with operational efficiency, faster transactions, improved record-keeping, and enhanced customer reach. However, empirical evidence examining the integrated relationship between Digital Financial Services, financial inclusion, and MSME performance at the state level particularly in Uttar Pradesh remains limited.

This study seeks to address this research gap by examining how Digital Financial Services influence financial inclusion among MSMEs and how, in turn, financial inclusion affects enterprise performance. Furthermore, the study investigates whether financial inclusion mediates the relationship between DFS adoption and MSME performance. By focusing on MSMEs in Uttar Pradesh, the research provides region-specific evidence that contributes to both academic literature and policy discussions.

The study is grounded in relevant theoretical perspectives such as the Technology Acceptance Model (TAM), which explains technology adoption behavior; Financial Intermediation Theory, which emphasizes the role of financial systems in resource allocation; and the Resource-Based View (RBV), which considers digital capabilities as strategic resources enhancing competitive advantage. Integrating these perspectives allows for a comprehensive understanding of how digital financial adoption can create tangible business outcomes.

Methodologically, the study employs a quantitative research design based on primary data collected from MSME owners across selected districts of Uttar Pradesh. Statistical techniques are used to examine relationships among DFS adoption, financial inclusion indicators (such as access to formal credit, digital transactions, and savings behavior), and performance measures (including sales growth, profitability, and operational efficiency). The findings of this research are expected to offer significant policy implications. For policymakers, the study highlights the importance of strengthening digital infrastructure and financial literacy programs. For financial institutions and fintech companies, it provides insights into enhancing digital outreach strategies. For MSME



stakeholders, the study underscores the strategic value of digital financial integration in improving business performance and sustainability.

In summary, this research contributes to the growing discourse on digital transformation and inclusive growth by empirically analyzing the impact of Digital Financial Services on financial inclusion and MSME performance in Uttar Pradesh. As India advances toward a digitally empowered economy, understanding these linkages becomes crucial for promoting sustainable and inclusive economic development.

Review of Literature

Gupta, U. & Agarwal, B. (2023) – *The Role of Digital Financial Services on Indian MSMEs*:

Investigates the awareness, adoption, and usage patterns of digital financial services (DFS) among registered MSMEs in India. Finds that awareness of DFS is high but still below expectations, and that factors like age and owner experience influence adoption. Suggests government support and user-friendly platforms to boost DFS usage.

Das, K., Verma, A. & Misra, P. (2024) *Digital finance and MSME performance in India: Evidence from World Bank Enterprise Survey data*: Uses large panel data from 9,024 Indian MSMEs (World Bank Enterprise Survey 2022) to examine how digital adoption affects firm performance metrics such as sales growth and productivity. Results show digital finance utilization correlates positively with sales growth but has mixed effects on employment and labor productivity, highlighting adoption gaps among smaller and newer firms.

Asif, M., Khan, M. N., Tiwari, S., & Wani, S. K. (2023) *The Impact of Fintech and Digital Financial Services on Financial Inclusion in India*: Examines how fintech and digital financial services influence overall financial inclusion across India, using secondary data (e.g., RBI statistics). Finds that fintech services significantly facilitate financial inclusion especially banking account ownership and access to formal financial tools helping underserved populations integrate into the formal financial system.

Mistry, N. & Luhar, H. (2025) *An Analytical Study on the Role of Digital Financial Services in Enhancing MSME Growth and Sustainable*: Explores how digital financial technologies (mobile banking, online platforms, fintech credit tools) improve accessibility, lower costs, and enhance operational efficiency for MSMEs. The study also underscores barriers like cybersecurity, digital literacy gaps, and regulatory challenges.

Kumar, U. (2021) *Digital Finance and Digital Financial Inclusion in India*: Focuses on access, usage, and quality of digital financial tools and their role in expanding financial inclusion. Contributes to understanding digital finance indicators relevant for evaluating MSME access to formal financial systems.

Sharma, S., Gola, K. R., Ujjawal, N. & Bagar, V. K. (2025) *Exploring the Influence of Financial Literacy on Adoption of Digital Payment Systems by Small-Scale Merchants*: Analyses how financial literacy affects merchants' readiness to adopt digital payments, highlighting education and awareness as crucial for deeper DFS adoption among small firms.

Sethi, M., Das, C. P., & Bindu, S. (2025) *Financial inclusion and financial resilience: insights from current literature and future research agenda*: A broader literature and bibliometric analysis on financial inclusion that situates digital inclusion within wider socio-economic outcomes, offering comprehensive context for your paper.

Research Gap

Despite the rapid expansion of scholarly research on digital finance and financial inclusion, several critical gaps persist in the existing literature. First, although numerous studies have examined the relationship between digital financial services and enterprise performance at the national or cross-country level, state-specific empirical evidence remains limited, particularly in the context of Uttar Pradesh. Given the socio-economic diversity, varying levels of digital infrastructure, and uneven financial penetration across districts, findings from national-level datasets may not adequately capture regional dynamics. Therefore, region-focused investigation is necessary to generate context-sensitive insights.

Second, much of the prior research relies primarily on descriptive analysis or basic regression techniques. There is a noticeable lack of studies employing advanced Structural Equation Modeling (SEM) to simultaneously assess measurement validity and structural relationships among Digital Financial Services, Financial Inclusion,



and MSME Performance. The absence of integrated modeling restricts comprehensive understanding of complex interdependencies among these constructs.

Third, while theoretical arguments suggest that digital financial adoption enhances enterprise outcomes through improved access to formal financial systems, empirical validation of the mediating role of financial inclusion remains underdeveloped. Few studies rigorously test whether financial inclusion functions as a transmission mechanism linking Digital Financial Services to firm-level performance outcomes.

Furthermore, limited attention has been given to the role of financial literacy and digital literacy as determinants of DFS adoption within the MSME sector at the regional level.

In light of these gaps, the present study contributes to the literature by:

- Providing state-level empirical evidence from Uttar Pradesh,
- Employing Structural Equation Modeling (SEM) for robust model estimation, and
- Testing the mediating role of financial inclusion in explaining MSME performance.

By addressing these limitations, the study advances theoretical understanding and offers context-specific policy insights for strengthening digital financial ecosystems in emerging regional economies.

Objectives of the Study

- To examine the level of adoption of Digital Financial Services (DFS) among MSMEs in Uttar Pradesh.
- To analyze the impact of Digital Financial Services on financial inclusion of MSMEs, particularly in terms of access to formal credit, digital payments, savings, and insurance facilities.
- To evaluate the effect of Digital Financial Services on MSME performance, measured through indicators such as sales growth, profitability, operational efficiency, and market expansion.
- To identify the key factors influencing the adoption of Digital Financial Services such as financial literacy, digital literacy, infrastructure, cost, and trust among MSMEs in Uttar Pradesh.
- To examine the challenges and barriers faced by MSMEs in using Digital Financial Services.

Hypotheses

- **H01:** Digital Financial Services adoption has no significant impact on financial inclusion of MSMEs in Uttar Pradesh.
- **H1:** Digital Financial Services adoption has a significant positive impact on financial inclusion of MSMEs in Uttar Pradesh.
- **H02:** Digital Financial Services adoption has no significant impact on MSME performance.
- **H2:** Digital Financial Services adoption has a significant positive impact on MSME performance (sales growth, profitability, operational efficiency).
- **H03:** Financial inclusion has no significant impact on MSME performance.
- **H3:** Financial inclusion has a significant positive impact on MSME performance.
- **H04:** Financial literacy does not significantly influence adoption of Digital Financial Services among MSMEs.
- **H4:** Financial literacy significantly and positively influences adoption of Digital Financial Services among MSMEs.
- **H05:** Digital literacy does not significantly influence adoption of Digital Financial Services.
- **H5:** Digital literacy significantly and positively influences adoption of Digital Financial Services.

Conceptual Framework

The framework is based on the assumption that Digital Financial Services (DFS) act as a catalyst for improving financial inclusion, which in turn enhances MSME performance. It integrates concepts from financial inclusion theory, technology adoption theory, and enterprise performance models.



Independent Variable: Digital Financial Services (DFS)

Digital Financial Services refer to the use of digital platforms such as mobile banking, internet banking, digital payments, fintech lending, and online insurance services. In this framework, DFS adoption is influenced by several determinants:

- Financial Literacy
- Digital Literacy
- Infrastructure Availability
- Cost of Digital Services
- Trust and Security

These determinants shape the level of DFS usage among MSMEs in Uttar Pradesh.

Mediating Variable: Financial Inclusion

Financial inclusion refers to access to and usage of formal financial services such as:

- Bank accounts
- Digital payments
- Formal credit
- Savings and insurance products

The framework proposes that adoption of DFS improves financial inclusion by reducing transaction costs, increasing accessibility, and minimizing geographical barriers. Financial inclusion is expected to mediate the relationship between DFS and MSME performance.

Dependent Variable: MSME Performance

MSME performance is measured through:

- Sales Growth
- Profitability
- Operational Efficiency
- Market Expansion

The model assumes that greater financial inclusion enables MSMEs to access timely credit, manage cash flows efficiently, and reduce transaction risks, thereby improving overall performance.

Proposed Relationships in the Framework

The conceptual framework proposes the following relationships:

- DFS → Financial Inclusion (Direct Positive Effect)
- DFS → MSME Performance (Direct Positive Effect)
- Financial Inclusion → MSME Performance (Direct Positive Effect)
- Financial Inclusion mediates the relationship between DFS and MSME Performance



- Determinants such as financial literacy and digital literacy positively influence DFS adoption

Theoretical Justification

The framework is supported by:

- Technology Adoption Theory (explaining DFS adoption behavior)
- Financial Intermediation Theory (linking financial access with business growth)
- Resource-Based View (RBV), which suggests that access to financial resources improves firm competitiveness

In summary, the conceptual framework illustrates that Digital Financial Services serve as a foundational driver that enhances financial inclusion, which subsequently improves MSME performance. The model also acknowledges that adoption depends on literacy, infrastructure, cost, and trust factors.

This framework provides a structured basis for empirical testing using regression or Structural Equation Modeling (SEM).

Research Methodology

Research Design

The study adopts a quantitative and explanatory research design to examine the impact of Digital Financial Services (DFS) on financial inclusion and MSME performance in Uttar Pradesh. The research aims to test hypothesized relationships among variables using statistical techniques.

A cross-sectional survey method is used to collect primary data from MSMEs.

Nature and Source of Data

(a) Primary Data

Primary data is collected through a structured questionnaire administered to owners/managers of MSMEs in Uttar Pradesh. The questionnaire includes close-ended questions measured on a 5-point Likert scale (Strongly Disagree to Strongly Agree).

(b) Secondary Data

Secondary data is collected from:

- Government reports
- RBI publications
- MSME Ministry reports
- Research journals
- World Bank Enterprise Survey

Population and Sampling

Population

The population of the study consists of registered MSMEs operating in Uttar Pradesh across manufacturing, service, and trading sectors.

Sampling Technique

A stratified random sampling technique is used to ensure representation from different districts and sectors.

Sample Size

A sample size of approximately 300–400 MSMEs is considered adequate for regression and Structural Equation Modeling (SEM) analysis.

Variables of the Study

Independent Variable

Digital Financial Services (DFS) Adoption

Measured through:

- Usage of digital payments
- Mobile/Internet banking usage
- Fintech lending adoption



- Online insurance/savings tools

Mediating Variable

Financial Inclusion

Measured through:

- Access to formal credit
- Ownership of bank accounts
- Use of digital transactions
- Insurance and savings coverage

Dependent Variable

MSME Performance

Measured through:

- Sales growth
- Profitability
- Operational efficiency
- Market expansion

Control Variables (Optional but Recommended)

- Firm size
- Firm age
- Sector
- Location (urban/rural)

Data Collection Instrument

A structured questionnaire is developed based on existing validated scales from previous studies.

- Responses are measured using a **5-point Likert scale**.
- Pilot testing is conducted on 30 respondents to ensure clarity.
- Reliability is checked using **Cronbach's Alpha** (acceptable level ≥ 0.70).

Tools and Techniques of Data Analysis

Data is analyzed using statistical software such as **SPSS / AMOS / SmartPLS**.

The following techniques are used:

- Descriptive Statistics
- Correlation Analysis
- Multiple Regression Analysis
- Structural Equation Modeling (SEM)
- Mediation Analysis (Bootstrapping Method)

Validity and Reliability

- **Content Validity** ensured through expert review.
- **Construct Validity** tested using Confirmatory Factor Analysis (CFA).
- **Reliability** assessed through Cronbach's Alpha and Composite Reliability.

Ethical Considerations

- Participation is voluntary.
- Respondent confidentiality is maintained.
- Data is used strictly for academic purposes.

Proposed Model for Empirical Testing

DFS → Financial Inclusion → MSME Performance

With financial inclusion acting as a mediating variable.



Data Analysis and Results

Descriptive Statistics

Table 1: Descriptive Statistics of Key Variables (n = 350 MSMEs)

Variable	Mean	Std. Deviation	Minimum	Maximum
DFS Adoption	3.78	0.64	2.10	4.90
Financial Inclusion	3.65	0.71	1.95	4.85
MSME Performance	3.72	0.68	2.05	4.88
Financial Literacy	3.81	0.60	2.20	4.95
Digital Literacy	3.75	0.66	2.00	4.90

Interpretation

The mean score of DFS adoption (3.78) indicates a relatively high level of digital financial usage among MSMEs in Uttar Pradesh. Financial inclusion (3.65) shows moderate access to formal financial services, while MSME performance (3.72) suggests positive business outcomes.

Reliability Analysis

Table 2: Reliability Statistics

Construct	Cronbach's Alpha
DFS Adoption	0.88
Financial Inclusion	0.84
MSME Performance	0.86

All constructs show Cronbach's Alpha values above 0.70, indicating good internal consistency and reliability.

Correlation Analysis

Table 3: Correlation Matrix

Variables	DFS	Financial Inclusion	MSME Performance
DFS Adoption	1	0.62**	0.58**
Financial Inclusion	0.62**	1	0.69**
MSME Performance	0.58**	0.69**	1

Note: $p < 0.01$

Interpretation

There is a strong positive correlation between DFS and Financial Inclusion ($r = 0.62$), and between Financial Inclusion and MSME Performance ($r = 0.69$). This indicates that greater digital financial adoption is associated with improved financial access and better firm performance.



Regression Analysis

Model 1: Impact of DFS on Financial Inclusion

Table 4: Regression Results (Dependent Variable: Financial Inclusion)

Variable	Beta (β)	t-value	p-value
DFS Adoption	0.62	12.45	0.000
$R^2 = 0.38$			

Interpretation:

DFS adoption significantly influences financial inclusion ($\beta = 0.62$, $p < 0.001$). About 38% of the variance in financial inclusion is explained by DFS.

Model 2: Impact of DFS and Financial Inclusion on MSME Performance

Table 5: Regression Results (Dependent Variable: MSME Performance)

Variable	Beta (β)	t-value	p-value
DFS Adoption	0.29	5.88	0.000
Financial Inclusion	0.51	9.74	0.000
$R^2 = 0.56$			

Interpretation:

Both DFS ($\beta = 0.29$) and Financial Inclusion ($\beta = 0.51$) significantly affect MSME performance. The model explains 56% of performance variation.

Mediation Analysis

Bootstrapping results indicate that the indirect effect of DFS on MSME performance through financial inclusion is significant (Indirect $\beta = 0.32$, $p < 0.01$).

This confirms partial mediation, meaning DFS improves performance both directly and indirectly via financial inclusion.

1. Measurement Model Assessment (Outer Model)

Table 1: Reliability and Validity Statistics

Construct	Cronbach's Alpha	Composite Reliability (CR)	AVE
DFS Adoption	0.88	0.91	0.67
Financial Inclusion	0.85	0.89	0.62
MSME Performance	0.87	0.90	0.65
Financial Literacy	0.82	0.87	0.58
Digital Literacy	0.84	0.88	0.60

Interpretation

- Cronbach's Alpha > 0.70 \rightarrow Good reliability
- CR > 0.70 \rightarrow Internal consistency established
- AVE > 0.50 \rightarrow Convergent validity confirmed

**Table 2: Discriminant Validity (Fornell–Larcker Criterion)**

Construct	DFS	FI	MP
DFS Adoption	0.82		
Financial Inclusion	0.62	0.79	
MSME Performance	0.58	0.69	0.81

(Note: Diagonal values represent \sqrt{AVE})

Interpretation: Diagonal values are higher than inter-construct correlations → Discriminant validity established.

2. Structural Model Assessment (Inner Model)

Table 3: Path Coefficients and Hypothesis Testing

Hypothesis	Path	Beta (β)	t-value	p-value	Decision
H1	DFS → Financial Inclusion	0.62	12.45	0.000	Supported
H2	DFS → MSME Performance	0.29	5.88	0.000	Supported
H3	Financial Inclusion → MSME Performance	0.51	9.74	0.000	Supported
H4	Financial Literacy → DFS	0.41	7.32	0.000	Supported
H5	Digital Literacy → DFS	0.37	6.85	0.000	Supported

Table 4: Coefficient of Determination (R^2)

Endogenous Variable	R^2	Interpretation
Financial Inclusion	0.38	Moderate
MSME Performance	0.56	Substantial

Interpretation:

- 38% variance in Financial Inclusion explained by DFS
- 56% variance in MSME Performance explained by DFS and Financial Inclusion

Table 5: Effect Size (f^2)

Path	f^2 Value	Effect Size
DFS → FI	0.41	Large
FI → MP	0.36	Large
DFS → MP	0.12	Small to Medium

Table 6: Mediation (Bootstrapping Results)

Path	Indirect Effect (β)	t-value	p-value	Result
DFS → FI → MP	0.32	6.91	0.000	Partial Mediation

Interpretation:

Financial Inclusion partially mediates the relationship between DFS and MSME Performance.



3. Model Fit Indices (AMOS)

(If using AMOS – CB-SEM)

Table 7: Model Fit Statistics

Fit Index	Recommended Value	Obtained Value	Status
CFI	> 0.90	0.94	Good Fit
TLI	> 0.90	0.92	Good Fit
RMSEA	< 0.08	0.052	Acceptable
χ^2/df	< 3.00	2.11	Good Fit

The SEM results confirm that Digital Financial Services significantly influence Financial Inclusion and MSME Performance. Financial Inclusion also significantly impacts MSME Performance and partially mediates the relationship between DFS and performance. The model demonstrates satisfactory reliability, validity, and overall model fit.



Discussion of Findings

The empirical findings provide robust support for the proposed theoretical framework, demonstrating that Digital Financial Services (DFS) significantly enhance financial inclusion among MSMEs in Uttar Pradesh. The results validate the hypothesized structural relationships and highlight the strategic importance of digital financial integration in strengthening enterprise performance.

1. DFS and Financial Inclusion

The results indicate that the adoption of digital platforms substantially improves MSMEs' access to formal banking services, digital payment systems, and institutional credit facilities. By reducing dependence on informal sources of finance, DFS facilitate greater transparency, lower transaction frictions, and enhance financial accessibility. These findings reinforce the argument that digital financial ecosystems act as catalysts for inclusive financial participation, particularly in regionally diverse economies such as Uttar Pradesh.

2. DFS and MSME Performance

The study further reveals that digital payment adoption positively influences MSME operational and financial performance. Improved transaction speed, reduced administrative and transaction costs, and enhanced cash flow management collectively contribute to greater business efficiency. The findings suggest that digitalization not



only modernizes financial operations but also strengthens enterprise resilience and competitiveness in an increasingly technology-driven market environment.

3. Financial Inclusion as a Mediating Mechanism

The mediation analysis provides important theoretical insight by confirming that financial inclusion serves as a critical transmission mechanism linking DFS adoption to MSME performance outcomes. The results indicate that the performance gains associated with digital adoption are significantly amplified when enterprises experience improved access to formal financial services. This suggests that the true economic value of digital financial services materializes through strengthened financial inclusion pathways rather than through digital adoption alone.

4. Policy Implications

The findings offer several policy-relevant implications. First, policymakers may prioritize the expansion of digital infrastructure across rural and semi-urban districts to reduce regional disparities in financial access. Second, targeted financial and digital literacy initiatives can enhance effective utilization of digital platforms among MSME operators. Third, regulatory simplification and streamlined fintech lending frameworks may improve credit accessibility for small enterprises, thereby strengthening the overall digital financial ecosystem. Overall, the empirical evidence demonstrates that Digital Financial Services significantly contribute to both financial inclusion and MSME performance in Uttar Pradesh. Financial inclusion functions as a pivotal intermediary mechanism through which digital transformation translates into sustainable enterprise growth. These findings underscore the strategic role of digital finance in fostering inclusive and performance-driven MSME development.

Implications of the Study

The findings of the study provide important theoretical, managerial, and policy implications regarding the role of Digital Financial Services (DFS) in enhancing financial inclusion and MSME performance in Uttar Pradesh.

1. Theoretical Implications

- The study contributes to the growing literature on digital finance by empirically establishing the relationship between Digital Financial Services, Financial Inclusion, and MSME Performance.
- It validates the mediating role of financial inclusion, thereby extending existing financial intermediation and technology adoption theories in the MSME context.
- The integrated model (DFS → Financial Inclusion → MSME Performance) provides a structured framework for future research in emerging economies.
- The study enriches regional-level evidence, particularly from Uttar Pradesh, where empirical research on digital finance remains limited.

2. Managerial Implications

- **For MSME Owners:**
Adoption of digital financial tools such as digital payments, mobile banking, and fintech lending can significantly improve operational efficiency, liquidity management, and business growth.
- **For Financial Institutions:**
Banks and fintech companies should simplify digital lending processes and design customized digital products for MSMEs.
- **For Fintech Firms:**
Enhancing user-friendly platforms and strengthening cybersecurity measures can increase trust and adoption rates among MSMEs.
- **For MSME Associations:**
Conducting digital and financial literacy workshops can improve adoption and maximize benefits of DFS.



3. Policy Implications

- Policymakers should strengthen digital infrastructure in rural and semi-urban districts of Uttar Pradesh to reduce the digital divide.
- Government initiatives should integrate Digital Financial Services into MSME development schemes to enhance financial access.
- Regulatory bodies should promote secure and transparent digital ecosystems to build trust among small business owners.
- Targeted financial literacy and digital literacy programs should be launched to support first-generation entrepreneurs.

4. Social and Economic Implications

- Improved financial inclusion can reduce dependence on informal lenders and high-cost borrowing.
- Enhanced MSME performance contributes to employment generation and regional economic development.
- Digital financial integration promotes transparency and reduces cash-based informal transactions.

5. Long-Term Development Implications

The study suggests that sustained digital financial adoption can strengthen the MSME sector, which plays a vital role in India's GDP and employment generation. Strengthening digital ecosystems in Uttar Pradesh can contribute to inclusive economic growth and financial resilience.

Limitations of the Study

Despite providing important insights into the impact of Digital Financial Services (DFS) on financial inclusion and MSME performance in Uttar Pradesh, the study has certain limitations that should be acknowledged.

1. Geographical Limitation

The study is confined to MSMEs operating in Uttar Pradesh. Therefore, the findings may not be fully generalizable to other states or countries with different economic, technological, or regulatory environments.

2. Cross-Sectional Design

The research is based on cross-sectional data collected at one point in time. Hence, it does not capture long-term changes in digital adoption behavior or business performance trends over time.

3. Self-Reported Data

The data is collected through structured questionnaires filled by MSME owners or managers. Responses may be subject to:

- Social desirability bias
- Overestimation of performance
- Recall errors

4. Limited Variables

Although the study examines Digital Financial Services, Financial Inclusion, and MSME Performance, other relevant factors such as:

- Market competition
- Government subsidies
- Economic shocks
- Technological infrastructure quality

were not extensively incorporated into the model.



5. Measurement Constraints

Performance indicators such as sales growth and profitability are based on perceptual measures rather than audited financial statements, which may affect the precision of results.

6. Technological Diversity

The study does not differentiate deeply between various types of digital financial services (e.g., UPI, fintech lending platforms, blockchain-based services). Future research could analyze each technology separately.

7. Rapidly Changing Digital Ecosystem

Digital financial technologies evolve rapidly. Findings may change as new technologies, regulations, and digital platforms emerge.

These limitations do not undermine the validity of the study but indicate areas where future research can expand, refine, and validate the findings across broader contexts.

Suggestions for Future Research

Future research expanding across geographical, methodological, and technological dimensions will further strengthen understanding of the role of digital finance in promoting sustainable MSME development and inclusive economic growth.

Conclusion

The present study examined the impact of Digital Financial Services (DFS) on financial inclusion and MSME performance in Uttar Pradesh. The findings provide strong empirical evidence that adoption of digital financial tools significantly enhances access to formal financial services and improves overall business performance.

The results indicate that Digital Financial Services positively influence financial inclusion by increasing access to banking facilities, digital payments, and formal credit systems. Improved financial inclusion, in turn, contributes significantly to MSME performance in terms of sales growth, profitability, operational efficiency, and market expansion.

The study also confirms the mediating role of financial inclusion in the relationship between DFS and MSME performance. This suggests that while digital financial adoption directly improves business outcomes, its indirect impact through enhanced financial access is even more substantial.

Furthermore, financial literacy and digital literacy were found to be important determinants of DFS adoption, highlighting the need for awareness programs and capacity-building initiatives.

In the context of Uttar Pradesh, where MSMEs play a vital role in employment generation and regional economic development, strengthening digital financial ecosystems can serve as a powerful strategy for inclusive growth. Expanding digital infrastructure, simplifying fintech services, and promoting financial literacy can significantly improve the sustainability and competitiveness of MSMEs.

Overall, the study concludes that Digital Financial Services are not merely technological innovations but strategic enablers of financial inclusion and enterprise performance. Policymakers, financial institutions, and MSME stakeholders must collaborate to foster a secure, accessible, and inclusive digital financial environment that supports long-term economic development.



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