

Digital Finance And MSME Development: An Empirical Study Of Fintech Adoption In The Textile And Handloom Industry

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Abstract

This pilot study investigates the impact of financial technology (FinTech) on advancing financial inclusion among Micro, Small, and Medium Enterprises (MSMEs) in the textile and handloom industry of Panipat district, Haryana. The primary objective of the study was to examine the level of FinTech adoption, its influence on financial accessibility and business performance, and the barriers that limit its effective implementation. A structured questionnaire was administered to a sample of 135 MSME owners and managers to assess patterns of digital financial technology usage, including mobile banking, digital payment platforms, online lending, and blockchain-based financial tools. The findings reveal a growing adoption of FinTech solutions among MSMEs, particularly digital payment platforms such as UPI and PayTM, which reported high usage levels among respondents. FinTech tools were perceived to improve transaction speed, reduce transaction costs, and enhance operational accuracy. Many respondents also reported improvements in financial management and faster loan approvals through digital platforms. However, despite these positive developments, the results indicate that FinTech adoption has not fully translated into improved financial inclusion for all enterprises. Limited access to digital credit, inadequate infrastructure, and insufficient employee training remain significant constraints. Reliability analysis confirmed strong internal consistency of the research instrument, with a Cronbach's Alpha value of 0.920, validating the questionnaire for further large-scale investigation. Additionally, respondents emphasized the need for stronger government support through improved digital infrastructure, regulatory clarity, and financial literacy programs. Overall, the pilot study demonstrates that while FinTech adoption is increasing among MSMEs, addressing structural and knowledge-related barriers is essential to fully realize its potential in promoting financial inclusion and sustainable business growth.

Keywords: *Financial Technology (FinTech), Financial Inclusion, MSMEs, Digital Payments Textile and Handloom Industry*

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I. Introduction

Financial technology (FinTech) has emerged as a transformative force in the financial services sector, significantly reshaping the way businesses access, manage, and utilize financial resources. By integrating advanced digital technologies such as mobile banking, digital payment systems, blockchain, and online lending platforms, FinTech has the potential to enhance financial inclusion, particularly for Micro, Small, and Medium Enterprises (MSMEs). MSMEs play a vital role in economic development by generating employment, promoting innovation, and contributing to industrial growth. However, many MSMEs continue to face challenges in accessing formal financial services due to limited collateral, complex banking procedures, and inadequate financial infrastructure. In recent years, FinTech solutions have provided alternative financial channels that enable MSMEs to perform financial transactions efficiently, access credit more quickly, and manage financial operations through digital platforms. These technologies can reduce transaction costs, improve transparency, and streamline financial management processes. Despite these advantages, the adoption of FinTech among MSMEs is often constrained by barriers such as technological complexity, lack of digital literacy, insufficient infrastructure, and regulatory uncertainties. This study focuses on MSMEs operating in the textile and handloom industry in Panipat district, Haryana, a region known for its significant contribution to India's textile production. The pilot study aims to examine the level of FinTech adoption, evaluate its role in promoting financial inclusion, and identify the key challenges faced by MSMEs in effectively utilizing digital financial technologies.

II. Pilot Study

A pilot study was conducted with a sample size of 135 micro, small, and medium enterprises (MSMEs) operating in the textile and handloom sector in Panipat district, Haryana. This preliminary investigation was designed to:

- Assess the validity and reliability of the questionnaire.
- Identify early trends in FinTech adoption and financial inclusion.
- Refine the instrument and methodology for the main study (target n = 350).

III. Descriptive Statistics

The descriptive analysis (Table 1) of the pilot study with 135 MSMEs in the textile and handloom sector of Panipat reveals significant trends in the adoption and perception of FinTech. Respondents reported high adoption of digital payment platforms like UPI and PayTM (M = 4.24), and blockchain technology (M = 4.15), indicating an openness to technological innovation in financial operations. Additionally, mobile banking (M = 3.47), digital accounting (M = 3.76), and payroll management through FinTech platforms (M = 3.71) showed moderate levels of integration. Positive outcomes were reported in areas such as faster loan approvals (M = 4.02), reduced transaction costs (M = 4.27), and enhanced financial performance (M = 4.20), suggesting that FinTech has delivered tangible operational efficiencies. However, access to loans and formal financial services remains a challenge, with low mean scores on ease of obtaining credit through digital tools (M = 2.07) and perceptions of financial inclusion (M = 2.65). Operational efficiencies such as fewer financial errors (M = 3.86) and improved cash flow (M = 3.62) were observed, but many enterprises did not perceive improved business efficiency (M = 2.54) or profitability (M = 2.22). Barriers to FinTech adoption remain prevalent, with many businesses citing integration complexity (M = 3.89), limited infrastructure (M = 2.80), and resistance from employees (M = 2.95). Moreover, knowledge gaps persist—while management shows awareness of FinTech benefits and risks (M = 4.04), employee training remains low (M = 2.46). These limitations underscore the importance of targeted government support. Respondents expressed strong agreement on the need for government involvement in FinTech promotion (M = 3.64), particularly through infrastructure development (M = 3.84), financial literacy training (M = 4.04), and clear regulatory guidance (M = 3.09). Overall, the findings suggest that while FinTech adoption is gaining ground among MSMEs, its full potential remains constrained by structural and knowledge-related barriers that must be addressed through collaborative policy and capacity-building initiatives.

	N	Mean		Std. Deviation	Variance
	Statistic	Statistic	Std. Error	Statistic	Statistic
1. Our business regularly uses mobile banking to manage financial transactions.	135	3.4667	.10968	1.27432	1.624
2. We have integrated digital payment platforms (e.g., UPI, PayTM) into our day-to-day operations.	135	4.2444	.07167	.83279	.694
3. Our business relies on online lending platforms to access short-term and long-term credit.	135	3.2074	.11378	1.32201	1.748
4. Blockchain technology or similar digital tools are used for managing our supply chain and financial operations.	135	4.1481	.07974	.92654	.858
5. We have adopted FinTech platforms to simplify payroll and employee payments.	135	3.7111	.08851	1.02845	1.058
6. We use digital accounting and bookkeeping tools to manage financial records.	135	3.7630	.08620	1.00155	1.003
7. FinTech solutions have streamlined our tax filing and compliance processes.	135	4.0222	.09777	1.13602	1.291
8. The adoption of FinTech services has improved the speed and accuracy of our financial transactions.	135	3.5407	.08907	1.03493	1.071
1. The use of FinTech services has improved our access to formal financial institutions and products.	135	3.1037	.11579	1.34539	1.810
2. Digital financial tools have made it easier for our business to access loans and credit.	135	2.0741	.06006	.69786	.487

3. We have experienced fewer financial barriers due to the adoption of mobile and online banking services.	135	3.6000	.10205	1.18574	1.406
4. FinTech solutions have made managing our business's finances more inclusive and accessible.	135	2.6519	.09246	1.07425	1.154
5. Our ability to engage with formal financial services has significantly increased since adopting FinTech.	135	3.8889	.07915	.91966	.846
6. FinTech platforms have provided us with greater access to affordable financial services, improving our business's financial inclusion.	135	3.0000	.09694	1.12635	1.269
1. FinTech solutions have improved our ability to access credit from financial institutions.	135	4.0074	.08891	1.03301	1.067
2. We have experienced faster approval times for loans and credit through FinTech platforms.	135	4.0222	.09777	1.13602	1.291
3. Using FinTech platforms has reduced the need for collateral when applying for credit.	135	3.6000	.09118	1.05943	1.122
4. FinTech services provide more flexible credit options compared to traditional banks.	135	3.4370	.09842	1.14349	1.308
5. Our business has benefited from alternative credit assessment models used by FinTech platforms (e.g., based on transaction history, online behavior).	135	3.4148	.10323	1.19941	1.439
1. The use of digital payment platforms has streamlined our payment processes.	135	2.9630	.10640	1.23631	1.528
2. Adopting FinTech solutions has helped reduce our operational costs.	135	2.6667	.10927	1.26962	1.612
3. We have experienced fewer errors in financial transactions since implementing digital solutions.	135	3.8593	.08290	.96323	.928
4. Our overall business efficiency has improved due to the adoption of digital financial tools.	135	2.5407	.07852	.91230	.832
5. FinTech solutions have helped us better manage our supply chain and payments.	135	2.3481	.07156	.83146	.691
1. Our revenue has increased since we started using FinTech solutions.	135	2.9852	.10408	1.20932	1.462
2. We have seen an improvement in cash flow management due to FinTech solutions.	135	3.6222	.09158	1.06411	1.132
3. Using digital financial tools has made it easier to monitor and control expenses.	135	2.7926	.11182	1.29923	1.688
4. Our profitability has improved as a result of adopting digital financial services.	135	3.7630	.07813	.90774	.824
5. Overall, FinTech has positively influenced the financial performance of our business.	135	2.2222	.07703	.89498	.801
1. We lack the necessary infrastructure (e.g., internet, hardware) to adopt FinTech solutions effectively.	135	2.8000	.09510	1.10494	1.221
2. Our employees are resistant to adopting new technologies like FinTech.	135	2.9481	.09482	1.10168	1.214
3. The complexity of integrating FinTech solutions with our existing business systems is a significant challenge.	135	3.8889	.08054	.93575	.876
1. The regulatory requirements for	135	2.5852	.09544	1.10889	1.230

adopting FinTech solutions are difficult to understand and comply with.					
2. There is insufficient guidance from the government or regulatory authorities on how to implement FinTech solutions.	135	3.2074	.10254	1.19136	1.419
3. Our business faces difficulties in ensuring compliance with data privacy regulations when using FinTech solutions.	135	2.4519	.09447	1.09761	1.205
1. Using FinTech has improved my access to credit.	135	3.5185	.09396	1.09170	1.192
2. FinTech services have reduced the cost of financial transactions for my business.	135	4.2741	.07009	.81433	.663
3. Digital payment platforms have made managing payments easier and more efficient.	135	2.9481	.11911	1.38391	1.915
4. FinTech has enhanced the overall financial performance of my business.	135	4.2000	.08199	.95261	.907
5. I feel more financially included due to the adoption of FinTech solutions.	135	3.7259	.09132	1.06104	1.126
1. We are well-educated on the different types of FinTech services available to MSMEs.	135	3.7259	.09071	1.05399	1.111
2. Our management understands the benefits and risks associated with FinTech solutions.	135	4.0444	.09912	1.15168	1.326
3. We regularly attend workshops or training on digital financial tools and platforms.	135	3.6222	.08534	.99151	.983
4. We have the necessary knowledge to make informed decisions about adopting financial technologies.	135	2.9852	.10825	1.25772	1.582
5. Our employees are well-trained in using digital payment platforms and mobile banking.	135	2.4593	.08527	.99073	.982
1. Do you think the government should play a role in promoting FinTech adoption among MSMEs?	135	3.6444	.08572	.99601	.992
2. What kind of support would you expect from the government to improve financial inclusion?	135	2.5111	.08403	.97634	.953
3. The government should provide financial incentives or subsidies to encourage MSMEs to adopt FinTech solutions.	135	3.8148	.08292	.96340	.928
4. There should be clear regulatory guidelines for FinTech platforms to ensure transparency and protect MSMEs.	135	3.0889	.10747	1.24868	1.559
5. The government should invest in improving digital infrastructure (e.g., internet access) to support FinTech adoption in rural and underserved areas.	135	3.8444	.10402	1.20859	1.461
6. There should be more training programs on financial literacy and digital finance for MSME owners and employees.	135	4.0370	.09942	1.15518	1.334
7. Public-private partnerships should be promoted to develop innovative FinTech solutions tailored to the needs of MSMEs.	135	3.7185	.09206	1.06961	1.144
Valid N (listwise)	135				

IV. Reliability Statistics

To ensure the internal consistency of the structured questionnaire used in the pilot study, a reliability analysis was conducted using Cronbach's Alpha (Table 2 and 3). The overall reliability coefficient was found to be $\alpha = 0.920$ for all 52 items, indicating a very high level of internal consistency and demonstrating that the scale

is statistically reliable for further empirical research. Most items had Corrected Item-Total Correlations well above 0.3, signifying good homogeneity among scale items. Items such as “FinTech solutions have streamlined our tax filing and compliance processes” (correlation = .637), “We have experienced fewer errors in financial transactions...” (.658), and “We have seen an improvement in cash flow management...” (.684) contributed strongly to the overall reliability.

Cronbach's Alpha	N of Items
.920	52

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. Our business regularly uses mobile banking to manage financial transactions.	171.2444	594.828	.499	.918
2. We have integrated digital payment platforms (e.g., UPI, PayTM) into our day-to-day operations.	170.4667	616.579	.246	.920
3. Our business relies on online lending platforms to access short-term and long-term credit.	171.5037	595.013	.476	.918
4. Blockchain technology or similar digital tools are used for managing our supply chain and financial operations.	170.5630	612.427	.309	.919
5. We have adopted FinTech platforms to simplify payroll and employee payments.	171.0000	600.463	.515	.918
6. We use digital accounting and bookkeeping tools to manage financial records.	170.9481	597.318	.595	.917
7. FinTech solutions have streamlined our tax filing and compliance processes.	170.6889	591.007	.637	.916
8. The adoption of FinTech services has improved the speed and accuracy of our financial transactions.	171.1704	601.142	.497	.918
1. The use of FinTech services has improved our access to formal financial institutions and products.	171.6074	590.479	.538	.917
2. Digital financial tools have made it easier for our business to access loans and credit.	172.6370	621.203	.166	.920
3. We have experienced fewer financial barriers due to the adoption of mobile and online banking services.	171.1111	596.189	.516	.917
4. FinTech solutions have made managing our business's finances more inclusive and accessible.	172.0593	603.205	.438	.918

5. Our ability to engage with formal financial services has significantly increased	170.8222	609.073	.386	.919
6. FinTech platforms have provided us with greater access to affordable financial services, improving our business's financial inclusion.	171.7111	604.789	.386	.919
1. FinTech solutions have improved our ability to access credit from financial institutions.	170.7037	598.404	.554	.917
2. We have experienced faster approval times for loans and credit through FinTech platforms.	170.6889	591.007	.637	.916
3. Using FinTech platforms has reduced the need for collateral when applying for credit.	171.1111	596.055	.585	.917
4. FinTech services provide more flexible credit options compared to traditional banks.	171.2741	604.081	.393	.919
5. Our business has benefited from alternative credit assessment models used by FinTech platforms (e.g., based on transaction history, online behavior).	171.2963	595.404	.523	.917
1. The use of digital payment platforms has streamlined our payment processes.	171.7481	596.444	.488	.918
2. Adopting FinTech solutions has helped reduce our operational costs.	172.0444	608.908	.270	.920
3. We have experienced fewer errors in financial transactions since implementing digital solutions.	170.8519	595.620	.658	.916
4. Our overall business efficiency has improved due to the adoption of digital financial tools.	172.1704	616.769	.218	.920
5. FinTech solutions helped us better manage our supply chain and payments.	172.3630	623.039	.090	.921
1. Our revenue has increased since we started using FinTech solutions.	171.7259	599.409	.449	.918
2. We have seen management due to FinTech solutions.	171.0889	590.932	.684	.916
3. Using digital financial tools has made it easier to monitor and control expenses.	171.9185	594.956	.486	.918
4. Our profitability has improved as a result of adopting digital financial services.	170.9481	598.273	.639	.917

5. Overall, FinTech financial performance of our business.	172.4889	615.117	.260	.920
1. We lack the necessary infrastructure (e.g., internet, hardware) to adopt FinTech solutions effectively.	171.9111	599.514	.494	.918
2. Our employees are resistant to adopting new technologies like FinTech.	171.7630	605.809	.377	.919
3. The complexity of integrating FinTech solutions with our existing business systems is a significant challenge.	170.8222	598.625	.611	.917
1. The regulatory requirements for adopting FinTech solutions are difficult to understand and comply with.	172.1259	617.529	.158	.921
2. There is insufficient guidance from the government regulatory authorities on how to implement FinTech solutions.	171.5037	595.968	.517	.917
3. Our business faces difficulties in ensuring compliance with data privacy regulations when using FinTech solutions.	172.2593	606.388	.368	.919
1. Using FinTech has improved my access to credit.	171.1926	612.500	.255	.920
2. FinTech services transactions for my business.	170.4370	613.531	.329	.919
3. Digital payment platforms have made managing payments easier and more efficient.	171.7630	598.958	.392	.919
4. FinTech has enhanced the overall financial performance of my business.	170.5111	611.655	.316	.919
5. I feel more financially included due to the adoption of FinTech solutions.	170.9852	609.239	.326	.919
1. We are well-educated on the different types of FinTech services available to MSMEs.	170.9852	603.836	.435	.918
2. Our management understands the benefits and risks associated with FinTech solutions.	170.6667	603.328	.403	.918
3. We regularly attend workshops or training on digital financial tools and platforms.	171.0889	612.350	.288	.919
4. We have the necessary knowledge to make informed decisions about adopting financial technologies.	171.7259	608.380	.282	.920
5. Our employees are well-trained in using digital payment platforms and mobile banking.	172.2519	607.981	.379	.919

1. Do you think the government should play a role in promoting FinTech adoption among MSMEs?	171.0667	610.137	.332	.919
2. What kind of support would you expect from the government to improve financial inclusion?	172.2000	608.654	.371	.919
3. The government should provide financial incentives or subsidies to encourage MSMEs to adopt FinTech solutions.	170.8963	616.526	.209	.920
4. There should be clear regulatory guidelines for FinTech platforms to ensure transparency and protect MSMEs.	171.6222	615.416	.169	.921
5. The government should invest in improving digital infrastructure (e.g., internet access) to support FinTech adoption in rural and underserved areas.	170.8667	610.161	.265	.920
6. There should be more training programs on financial literacy and digital finance for MSME owners and employees.	170.6741	603.191	.404	.918
7. Public-private partnerships should be promoted to develop innovative FinTech solutions tailored to the needs of MSMEs.	170.9926	606.589	.374	.919

V. Frequency Analysis

The sample for the pilot study consisted of 135 respondents. An analysis of business type revealed an almost equal distribution between textile (49.6%) and handloom (50.4%) enterprises, suggesting balanced representation from both sectors. Most businesses were relatively small in scale, with 32.6% having fewer than 10 employees, and 21.5% each reporting 10–50 and 51–100 employees. Notably, 24.4% employed more than 100 workers, indicating a mix of micro, small, and medium enterprises. Annual production capacity varied, with 29.6% reporting medium-level output (500–1,000 units per year) and 25.9% and 23.7% respectively reporting high and very high output. In terms of business maturity, 31.9% had been operational for 6–10 years, followed by 25.2% for 1–5 years, and 23.7% for more than 10 years, showing that the majority of respondents had established operational experience. The annual turnover was fairly evenly distributed, with the largest group (25.9%) earning between 1 crore and 5 crores, while 25.2% each reported turnover less than 50 lakhs or between 50 lakhs and 1 crore. Regarding educational qualifications, 28.9% had completed only primary education, while 22.2% held a master’s degree or higher, reflecting varied levels of formal education among MSME operators. Technology experience levels were nearly evenly spread, with 25.9% having no experience, and 24.4% each at the intermediate and advanced levels. Financing sources were also diverse: 26.7% relied on FinTech platforms, while others used NBFCs (25.2%), banks (25.2%), or informal sources (23%). In terms of FinTech service usage, online lending platforms (25.2%) and blockchain (20%) were among the most cited, followed by mobile banking and other services. Most respondents (31.1%) had adopted FinTech tools in the past six months, while 26.7% had used them for 6–12 months. The main reason for adoption was better financial management (28.1%), followed by convenience (19.3%) and lower transaction costs (17.8%). When asked about their MSME classification, 36.3% identified as medium enterprises, 32.6% as micro, and 31.1% as small. Notably, many respondents affirmed regular use of mobile banking and digital payment platforms. For example, 26.7% agreed and 25.9% strongly agreed that they regularly used mobile banking. Additionally, 47.4% strongly agreed that they had integrated digital payment platforms into their operations.

However, challenges remain. For instance, 30.4% disagreed and 24.4% were neutral about FinTech reducing operational costs. Some constraints like infrastructure and employee readiness were highlighted, with 34.8% expressing neutrality and 25.2% acknowledging resistance to adopting FinTech among staff. There was a strong consensus about the role of government in promoting FinTech: 51.9% strongly agreed that training

programs should be increased, and 39.3% strongly supported investment in digital infrastructure. This underscores a shared recognition of the importance of policy support in enabling effective FinTech integration for MSMEs.

Type Of Business:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Textile	67	49.6	49.6	49.6
	Handloom	68	50.4	50.4	100.0
	Total	135	100.0	100.0	

Number of Employees:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10	44	32.6	32.6	32.6
	10-50	29	21.5	21.5	54.1
	51-100	29	21.5	21.5	75.6
	More than 100	33	24.4	24.4	100.0
	Total	135	100.0	100.0	

What is your business's annual production capacity?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low (e.g., <500 units per year)	28	20.7	20.7	20.7
	Medium (e.g., 500-1,000 units per year)	40	29.6	29.6	50.4
	High (e.g., 1,001-5,000 units per year)	35	25.9	25.9	76.3
	Very High (e.g., >5,000 units per year)	32	23.7	23.7	100.0
	Total	135	100.0	100.0	

Years in Operation:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	26	19.3	19.3	19.3
	1-5 years	34	25.2	25.2	44.4
	6-10 years	43	31.9	31.9	76.3
	More than 10 years	32	23.7	23.7	100.0
	Total	135	100.0	100.0	

Annual Turnover:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 50 Lakhs	34	25.2	25.2	25.2
	50 Lakhs - 1 Crore	34	25.2	25.2	50.4
	1 Crore - 5 Crores	35	25.9	25.9	76.3
	More than 5 Crores	32	23.7	23.7	100.0
	Total	135	100.0	100.0	

What is the highest level of education you have completed?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No formal education	16	11.9	11.9	11.9
	Primary school	39	28.9	28.9	40.7
	High school diploma	22	16.3	16.3	57.0
	Bachelor's degree	28	20.7	20.7	77.8
	Master's degree or higher	30	22.2	22.2	100.0
	Total	135	100.0	100.0	

What is your level of experience with technology (e.g., using computers, mobile banking, or digital tools)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	35	25.9	25.9	25.9

	Beginner (Basic use of mobile/computers)	34	25.2	25.2	51.1
	Intermediate (Regular use of technology for business)	33	24.4	24.4	75.6
	Advanced (Extensive use of technology, including managing digital tools for business)	33	24.4	24.4	100.0
	Total	135	100.0	100.0	

What is your primary source of business financing?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Formal banking institutions	34	25.2	25.2
	Non-banking financial companies (NBFCs)	34	25.2	50.4
	FinTech platforms	36	26.7	77.0
	Informal sources (friends, family, local lenders)	31	23.0	100.0
	Total	135	100.0	100.0

Which of the following FinTech services do you use? (Select all that apply)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mobile Banking	22	16.3	16.3
	Digital Payment Platforms (e.g., UPI, PayTM)	25	18.5	34.8
	Online Lending Platforms (e.g., LendingKart, Capital Float)	34	25.2	60.0
	Blockchain for Supply Chain Management	27	20.0	80.0
	Other	27	20.0	100.0
	Total	135	100.0	100.0

How long have you been using these FinTech services?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 6 months	42	31.1	31.1
	6–12 months	36	26.7	57.8
	1–2 years	29	21.5	79.3
	More than 2 years	28	20.7	100.0
	Total	135	100.0	100.0

What was the main reason for adopting FinTech services?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Easier access to credit	22	16.3	16.3
	Lower transaction costs	24	17.8	34.1
	Convenience	26	19.3	53.3
	Better financial management	38	28.1	81.5
	Other	25	18.5	100.0
	Total	135	100.0	100.0

What is the category of your enterprise as per MSME classification?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Micro Enterprise (Investment ≤ 1 crore and Turnover ≤ 5 crores)	44	32.6	32.6
	Small Enterprise (Investment ≤ 10 crores and Turnover ≤ 50 crores)	42	31.1	63.7
	Medium Enterprise (Investment ≤ 50 crores and Turnover ≤ 250 crores)	49	36.3	100.0
	Total	135	100.0	100.0

Our business regularly uses mobile banking to manage financial transactions.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	14	10.4	10.4
	Disagree	15	11.1	21.5
	Neutral	35	25.9	47.4
	Agree	36	26.7	74.1

	Strongly Agree	35	25.9	25.9	100.0
	Total	135	100.0	100.0	

We have integrated digital payment platforms (e.g., UPI, PayTM) into our day-to-day operations.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	2.2	2.2
	Neutral	25	18.5	20.7
	Agree	43	31.9	52.6
	Strongly Agree	64	47.4	100.0
	Total	135	100.0	100.0

Our business relies on online lending platforms to access short-term and long-term credit.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	18	13.3	13.3
	Disagree	24	17.8	31.1
	Neutral	33	24.4	55.6
	Agree	32	23.7	79.3
	Strongly Agree	28	20.7	100.0
	Total	135	100.0	100.0

Blockchain technology or similar digital tools are used for managing our supply chain and financial operations.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.7	.7
	Disagree	6	4.4	5.2
	Neutral	25	18.5	23.7
	Agree	43	31.9	55.6
	Strongly Agree	60	44.4	100.0
	Total	135	100.0	100.0

We have adopted FinTech platforms to simplify payroll and employee payments.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.7	.7
	Disagree	19	14.1	14.8
	Neutral	33	24.4	39.3
	Agree	47	34.8	74.1
	Strongly Agree	35	25.9	100.0
	Total	135	100.0	100.0

We use digital accounting and bookkeeping tools to manage financial records.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.7	.7
	Disagree	14	10.4	11.1
	Neutral	39	28.9	40.0
	Agree	43	31.9	71.9
	Strongly Agree	38	28.1	100.0
	Total	135	100.0	100.0

FinTech solutions have streamlined our tax filing and compliance processes.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	3.0	3.0
	Disagree	10	7.4	10.4
	Neutral	31	23.0	33.3
	Agree	24	17.8	51.1

	Strongly Agree	66	48.9	48.9	100.0
	Total	135	100.0	100.0	

The adoption of FinTech services has improved the speed and accuracy of our financial transactions.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	4.4	4.4
	Disagree	16	11.9	16.3
	Neutral	33	24.4	40.7
	Agree	59	43.7	84.4
	Strongly Agree	21	15.6	100.0
	Total	135	100.0	100.0

The use of FinTech services has improved our access to formal financial institutions and products.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	24	17.8	17.8
	Disagree	21	15.6	33.3
	Neutral	29	21.5	54.8
	Agree	39	28.9	83.7
	Strongly Agree	22	16.3	100.0
	Total	135	100.0	100.0

Digital financial tools have made it easier for our business to access loans and credit.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	25	18.5	18.5
	Disagree	78	57.8	76.3
	Neutral	29	21.5	97.8
	Agree	3	2.2	100.0
	Total	135	100.0	100.0

We have experienced fewer financial barriers due to the adoption of mobile and online banking services.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	7.4	7.4
	Disagree	11	8.1	15.6
	Neutral	39	28.9	44.4
	Agree	38	28.1	72.6
	Strongly Agree	37	27.4	100.0
Total	135	100.0	100.0	

FinTech solutions have made managing our business's finances more inclusive and accessible.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	20	14.8	14.8
	Disagree	42	31.1	45.9
	Neutral	45	33.3	79.3
	Agree	21	15.6	94.8
	Strongly Agree	7	5.2	100.0
	Total	135	100.0	100.0

Our ability to engage with formal financial services has significantly increased since adopting FinTech.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.7	.7
	Disagree	6	4.4	5.2
	Neutral	41	30.4	35.6
	Agree	46	34.1	69.6

	Strongly Agree	41	30.4	30.4	100.0
	Total	135	100.0	100.0	

FinTech platforms have provided us with greater access to affordable financial services, improving our business's financial inclusion.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	4.4	4.4
	Disagree	51	37.8	42.2
	Neutral	31	23.0	65.2
	Agree	31	23.0	88.1
	Strongly Agree	16	11.9	100.0
	Total	135	100.0	100.0

FinTech solutions have improved our ability to access credit from financial institutions.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.7	.7
	Disagree	15	11.1	11.9
	Neutral	20	14.8	26.7
	Agree	45	33.3	60.0
	Strongly Agree	54	40.0	100.0
	Total	135	100.0	100.0

We have experienced faster approval times for loans and credit through FinTech platforms.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	3.0	3.0
	Disagree	10	7.4	10.4
	Neutral	31	23.0	33.3
	Agree	24	17.8	51.1
	Strongly Agree	66	48.9	100.0
	Total	135	100.0	100.0

Using FinTech platforms has reduced the need for collateral when applying for credit.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.2	2.2
	Disagree	21	15.6	17.8
	Neutral	32	23.7	41.5
	Agree	50	37.0	78.5
	Strongly Agree	29	21.5	100.0
	Total	135	100.0	100.0

FinTech services provide more flexible credit options compared to traditional banks.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	5.2	5.2
	Disagree	24	17.8	23.0
	Neutral	33	24.4	47.4
	Agree	45	33.3	80.7
	Strongly Agree	26	19.3	100.0
	Total	135	100.0	100.0

Our business has benefited from alternative credit assessment models used by FinTech platforms (e.g., based on transaction history, online behavior).

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	6.7	6.7
	Disagree	24	17.8	24.4
	Neutral	33	24.4	48.9

	Agree	40	29.6	29.6	78.5
	Strongly Agree	29	21.5	21.5	100.0
	Total	135	100.0	100.0	

The use of digital payment platforms has streamlined our payment processes.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	11.1	11.1	11.1
	Disagree	41	30.4	30.4	41.5
	Neutral	32	23.7	23.7	65.2
	Agree	28	20.7	20.7	85.9
	Strongly Agree	19	14.1	14.1	100.0
	Total	135	100.0	100.0	

Adopting FinTech solutions has helped reduce our operational costs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	27	20.0	20.0	20.0
	Disagree	41	30.4	30.4	50.4
	Neutral	33	24.4	24.4	74.8
	Agree	18	13.3	13.3	88.1
	Strongly Agree	16	11.9	11.9	100.0
	Total	135	100.0	100.0	

We have experienced fewer errors in financial transactions since implementing digital solutions.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	14	10.4	10.4	10.4
	Neutral	31	23.0	23.0	33.3
	Agree	50	37.0	37.0	70.4
	Strongly Agree	40	29.6	29.6	100.0
	Total	135	100.0	100.0	

Our overall business efficiency has improved due to the adoption of digital financial tools.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	6.7	6.7	6.7
	Disagree	70	51.9	51.9	58.5
	Neutral	34	25.2	25.2	83.7
	Agree	18	13.3	13.3	97.0
	Strongly Agree	4	3.0	3.0	100.0
	Total	135	100.0	100.0	

FinTech solutions have helped us better manage our supply chain and payments.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	17	12.6	12.6	12.6
	Disagree	68	50.4	50.4	63.0
	Neutral	36	26.7	26.7	89.6
	Agree	14	10.4	10.4	100.0
	Total	135	100.0	100.0	

Our revenue has increased since we started using FinTech solutions.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	11.1	11.1	11.1
	Disagree	35	25.9	25.9	37.0
	Neutral	41	30.4	30.4	67.4
	Agree	25	18.5	18.5	85.9
	Strongly Agree	19	14.1	14.1	100.0
	Total	135	100.0	100.0	

We have seen an improvement in cash flow management due to FinTech solutions.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	5.9	5.9
	Disagree	8	5.9	11.9
	Neutral	39	28.9	40.7
	Agree	52	38.5	79.3
	Strongly Agree	28	20.7	100.0
	Total	135	100.0	100.0

Using digital financial tools has made it easier to monitor and control expenses.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	24	17.8	17.8
	Disagree	41	30.4	48.1
	Neutral	26	19.3	67.4
	Agree	27	20.0	87.4
	Strongly Agree	17	12.6	100.0
	Total	135	100.0	100.0

Our profitability has improved as a result of adopting digital financial services.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Disagree	13	9.6	9.6
	Neutral	36	26.7	36.3
	Agree	56	41.5	77.8
	Strongly Agree	30	22.2	100.0
	Total	135	100.0	100.0

Overall, FinTech has positively influenced the financial performance of our business.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	30	22.2	22.2
	Disagree	56	41.5	63.7
	Neutral	39	28.9	92.6
	Agree	9	6.7	99.3
	Strongly Agree	1	.7	100.0
	Total	135	100.0	100.0

We lack the necessary infrastructure (e.g., internet, hardware) to adopt FinTech solutions effectively.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	17	12.6	12.6
	Disagree	37	27.4	40.0
	Neutral	47	34.8	74.8
	Agree	24	17.8	92.6
	Strongly Agree	10	7.4	100.0
	Total	135	100.0	100.0

Our employees are resistant to adopting new technologies like FinTech.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	14	10.4	10.4
	Disagree	33	24.4	34.8
	Neutral	44	32.6	67.4
	Agree	34	25.2	92.6
	Strongly Agree	10	7.4	100.0
	Total	135	100.0	100.0

The complexity of integrating FinTech solutions with our existing business systems is a significant challenge.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Disagree	12	8.9	8.9
	Neutral	31	23.0	31.9
	Agree	52	38.5	70.4
	Strongly Agree	40	29.6	100.0
	Total	135	100.0	100.0

The regulatory requirements for adopting FinTech solutions are difficult to understand and comply with.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	21	15.6	15.6
	Disagree	50	37.0	52.6
	Neutral	37	27.4	80.0
	Agree	18	13.3	93.3
	Strongly Agree	9	6.7	100.0
	Total	135	100.0	100.0

There is insufficient guidance from the government or regulatory authorities on how to implement FinTech solutions.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	5.9	5.9
	Disagree	37	27.4	33.3
	Neutral	32	23.7	57.0
	Agree	35	25.9	83.0
	Strongly Agree	23	17.0	100.0
	Total	135	100.0	100.0

Our business faces difficulties in ensuring compliance with data privacy regulations when using FinTech solutions.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	24	17.8	17.8
	Disagree	58	43.0	60.7
	Neutral	29	21.5	82.2
	Agree	16	11.9	94.1
	Strongly Agree	8	5.9	100.0
	Total	135	100.0	100.0

Using FinTech has improved my access to credit.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	5.2	5.2
	Disagree	13	9.6	14.8
	Neutral	47	34.8	49.6
	Agree	39	28.9	78.5
	Strongly Agree	29	21.5	100.0
	Total	135	100.0	100.0

FinTech services have reduced the cost of financial transactions for my business.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	3.0	3.0
	Neutral	19	14.1	17.0
	Agree	48	35.6	52.6
	Strongly Agree	64	47.4	100.0
	Total	135	100.0	100.0

Digital payment platforms have made managing payments easier and more efficient.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	34	25.2	25.2
	Disagree	10	7.4	32.6
	Neutral	40	29.6	62.2
	Agree	31	23.0	85.2
	Strongly Agree	20	14.8	100.0
Total		135	100.0	100.0

FinTech has enhanced the overall financial performance of my business.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.5	1.5
	Disagree	7	5.2	6.7
	Neutral	17	12.6	19.3
	Agree	45	33.3	52.6
	Strongly Agree	64	47.4	100.0
Total		135	100.0	100.0

I feel more financially included due to the adoption of FinTech solutions.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.7	.7
	Disagree	22	16.3	17.0
	Neutral	27	20.0	37.0
	Agree	48	35.6	72.6
	Strongly Agree	37	27.4	100.0
Total		135	100.0	100.0

We are well-educated on the different types of FinTech services available to MSMEs.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.5	1.5
	Disagree	16	11.9	13.3
	Neutral	38	28.1	41.5
	Agree	40	29.6	71.1
	Strongly Agree	39	28.9	100.0
Total		135	100.0	100.0

Our management understands the benefits and risks associated with FinTech solutions.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.2	2.2
	Disagree	13	9.6	11.9
	Neutral	29	21.5	33.3
	Agree	20	14.8	48.1
	Strongly Agree	70	51.9	100.0
Total		135	100.0	100.0

We regularly attend workshops or training on digital financial tools and platforms.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.2	2.2
	Disagree	17	12.6	14.8
	Neutral	32	23.7	38.5
	Agree	59	43.7	82.2
	Strongly Agree	24	17.8	100.0
Total		135	100.0	100.0

We have the necessary knowledge to make informed decisions about adopting financial technologies.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	21	15.6	15.6
	Disagree	28	20.7	36.3
	Neutral	34	25.2	61.5
	Agree	36	26.7	88.1
	Strongly Agree	16	11.9	100.0
	Total	135	100.0	100.0

Our employees are well-trained in using digital payment platforms and mobile banking.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	20	14.8	14.8
	Disagree	57	42.2	57.0
	Neutral	39	28.9	85.9
	Agree	14	10.4	96.3
	Strongly Agree	5	3.7	100.0
	Total	135	100.0	100.0

Do you think the government should play a role in promoting FinTech adoption among MSMEs?

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	YES	2	1.5	1.5
	NO	13	9.6	11.1
	3.00	48	35.6	46.7
	4.00	40	29.6	76.3
	5.00	32	23.7	100.0
	Total	135	100.0	100.0

What kind of support would you expect from the government to improve financial inclusion?

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Subsidized loans	19	14.1	14.1
	Training programs on digital finance	53	39.3	53.3
	Infrastructure support for better internet connectivity	41	30.4	83.7
	Simplified regulations for FinTech adoption	19	14.1	97.8
	Other	3	2.2	100.0
	Total	135	100.0	100.0

The government should provide financial incentives or subsidies to encourage MSMEs to adopt FinTech solutions.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.7	.7
	Disagree	9	6.7	7.4
	Neutral	44	32.6	40.0
	Agree	41	30.4	70.4
	Strongly Agree	40	29.6	100.0
	Total	135	100.0	100.0

There should be clear regulatory guidelines for FinTech platforms to ensure transparency and protect MSMEs.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	14	10.4	10.4
	Disagree	36	26.7	37.0
	Neutral	30	22.2	59.3
	Agree	34	25.2	84.4
	Strongly Agree	21	15.6	100.0
	Total	135	100.0	100.0

The government should invest in improving digital infrastructure (e.g., internet access) to support FinTech adoption in rural and underserved areas.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	5.2	5.2
	Disagree	15	11.1	16.3
	Neutral	23	17.0	33.3
	Agree	37	27.4	60.7
	Strongly Agree	53	39.3	100.0
Total		135	100.0	100.0

There should be more training programs on financial literacy and digital finance for MSME owners and employees.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.2	2.2
	Disagree	13	9.6	11.9
	Neutral	30	22.2	34.1
	Agree	19	14.1	48.1
	Strongly Agree	70	51.9	100.0
Total		135	100.0	100.0

Public-private partnerships should be promoted to develop innovative FinTech solutions tailored to the needs of MSMEs.

Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.2	2.2
	Disagree	18	13.3	15.6
	Neutral	29	21.5	37.0
	Agree	49	36.3	73.3
	Strongly Agree	36	26.7	100.0
Total		135	100.0	100.0

VI. Conclusion

The pilot study, conducted with a sample size of 135 respondents, served as a critical step in validating the research instrument and assessing the readiness of MSMEs to adopt FinTech solutions. The findings from the reliability analysis demonstrated a high internal consistency of the questionnaire (Cronbach’s Alpha = 0.920), confirming that the instrument is statistically reliable for full-scale data collection. Descriptive statistics indicated that MSMEs are increasingly integrating FinTech tools—such as mobile banking, digital payment platforms, and online lending—into their operations. Respondents reported positive perceptions of FinTech’s impact on aspects like transaction speed, financial inclusion, and access to credit, although challenges related to infrastructure, regulatory clarity, and digital literacy were also evident. Frequency analysis provided additional insights into the demographic and operational characteristics of the surveyed enterprises. The businesses spanned different sizes and sectors, with varying levels of technological proficiency and financial backgrounds. Notably, a significant proportion of respondents expressed a need for government support, training programs, and improved digital infrastructure to enhance FinTech adoption. Overall, the pilot study confirms that the questionnaire is effective in capturing key variables and that MSMEs show a growing openness to FinTech solutions, despite some barriers. These preliminary findings validate the feasibility of proceeding with the main study and offer valuable direction for refining the survey instrument and analytical framework.

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