

The Role of Digital Financial Services on Indian MSMEs

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Abstract

Purpose : This paper aimed to examine the role of digital financial services on registered micro, small, and medium enterprises in India. This study examined the MSME knowledge, usage, and preferences about several digital financial technologies. Further, the paper discussed the impact of demographic variables on DFS adoption.

Methodology : Primary data were gathered for the study. The questionnaire had three parts. The first part covered demographic variables. The second part identified questions related to DFS awareness and the reason for adopting DFS. The last part covered DFS adoption in various financial activities.

Findings : DFS awareness in the MSME sector was high but far from the required level. Demonetization and COVID-19 also increased the awareness of DFS in the Indian MSME sector. The DFS adoption was found to be affected by the age and experience of the owner/manager. Also, the educational level of the owner/manager did not always impact the DFS adoption.

Practical Implications : Digital financial service providers should increase customer satisfaction and reduce administrative expenses by making their website or application user-friendly to attract MSMEs. Additional government support is essential to enhance DFS awareness among MSMEs.

Originality/Value : This study added to the limited existing literature on MSMEs and their knowledge of digital payments.

Keywords : digital financial services, Indian MSMEs, demographic variables, mobile payments

JEL Classification Codes : G2, G5, G40, G53, L29, O33

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India has the most prominent young population in the world, and to seize this opportunity, it needs to increase employment. The MSME sector has emerged as a highly vibrant and dynamic sector of the Indian economy. It contributes significantly to the country's economic and social development by fostering entrepreneurship and generating significant employment opportunities at comparatively lower capital costs next to agriculture (Ministry of Micro, Small and Medium Enterprises, 2021). In both developing and developed countries, MSMEs play a crucial role in the country's overall growth (Basri & Shetty, 2018; Tomar, 2017) and have been an essential source of employment generation (Agyapong, 2010).

MSMEs in India contribute 50% to the manufacturing sector income, 30% to national exports, and employ 90% of the workforce (Ministry of Micro, Small and Medium Enterprises, 2021). However, a lack of finance creates a barrier to the growth of SMEs globally (Global Partnership for Financial Inclusion, 2020). This barrier can be removed by adopting digital financial services (Pazarbasioglu et al., 2020). Financial services (such as

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payments, remittances, and credit) that are accessible and delivered through digital means, including mobile devices, are known as digital financial services (DFS) (Agur et al., 2020).

Over the last 5 years, digital transactions have grown astronomically at a time when other enabling factors and supporting infrastructure were still developing. Additionally, the COVID-19 outbreak has shown that people can quickly become tech-savvy and be compelled to manage their funds electronically (Setiawan et al., 2021). As a result, digital transactions in India increased rapidly in 2020 (Table 1). According to a November 2021 report on digital lending by the RBI, Indian banks and financial services companies have steadily embraced technology to boost their operational efficiency, client satisfaction, and reach. Some popular DFS models are mobile money as M-Pesa, big tech platforms such as Alibaba, and Open Application Programming Interfaces (APIs) such as Aadhaar biometric identification system (Pazarbasioglu et al., 2020) are accepted widely by MSMEs. There are various types of digital payments, such as UPI, USSD, and NACH, of which UPI is the most used digital payment system per NPCI (Figure 1). There is a significant increase in the volume of transactions in 2020 compared to 2018. The Paytm Payment Bank processed the most UPI transactions in India in 2021 (Table 2).

However, MSMEs' ability to adapt to digital financial services is constrained by factors like lack of technical know-how, risk related to DFS, and unskilled workforce (Indrawati et al., 2020). Indian large businesses have adopted the technology at a much faster rate as compared to developed nations. India's widespread adoption of mobile solutions led to India being considered a case study for adopting digital financial services to reach huge populations (Kaka et al., 2019). Due to the competitive pressure and numerous advantages, MSMEs are incrementally adopting DFS (PWC, 2014).

Hence, investigating DFS adoption and its leverage on MSMEs is quite interesting because it is still one of India's most financially challenged sectors (Hakeem, 2019). The dramatic interest in DFS in recent years has highlighted the need for a deeper understanding of the importance of technological improvements for MSMEs. Most prior research focused more on the digital financial framework of large organizations. However, the process of DFS adoption in MSMEs is considerably different, which is not discussed in past literature. Compared to much earlier research, the proposed study thus offers a significant contribution to the field. The current study has the following research questions due to the increased influence of these recent changes on small and medium-sized businesses:

Table 1. Digital Transactions in India (2020)

Months	Volume (Lakhs)
January	33898.96
February	32523.41
March	29909.81
April	23604.53
May	25574.32
June	29095.89
July	31281.83
August	34689.28
September	36183.61
October	39946.81
November	40974.44
December	42659.73

Source : UPI Product Statistics of NPCI. (n.d.).

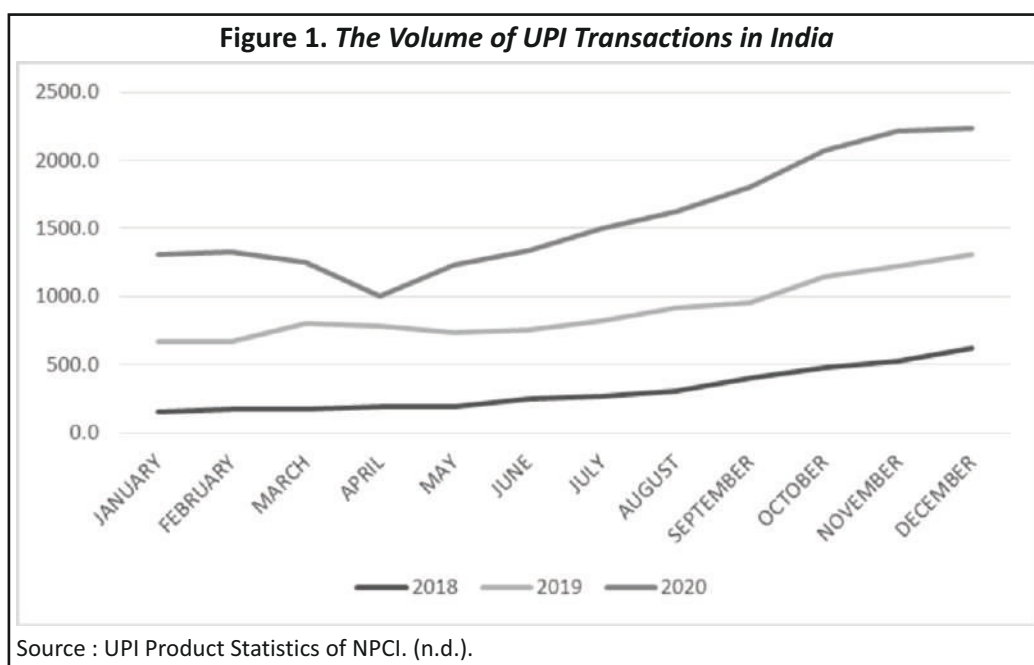


Table 2. Top 10 UPI Beneficiary Banks of India

S. No.	UPI Beneficiary Banks	Total Volume of Digital Transactions
1	Paytm Payments Bank	1726.94
2	Yes Bank Ltd	1309.96
3	State Bank of India	938.15
4	Axis Bank Ltd	562.51
5	ICICI Bank	543.27
6	HDFC Bank Ltd	384.38
7	Bank of Baroda	249.01
8	Union Bank of India	242.13
9	Canara Bank	185.71
10	Federal Bank	175.68

Source : UPI Product Statistics of NPCI. (n.d.).

- **R1.** To evaluate the awareness level of digital financial services among MSMEs.
- **R2.** To ascertain the MSME preference and acceptance toward digital financial services.
- **R3.** To analyze the impact of the demographic variable on DFS adoption.

It is assumed that answering the first two questions will help explore the DFS awareness level among the Indian MSME sector. It is also believed that answering the third question will help find out the most influencing demographic variable in the decision-making process of the Indian MSME sector.

Significance of the Study

Nowadays, everyone is adopting digital platforms for their continuation of work because of the pandemic, and MSMEs are also among them. MSMEs are incorporating digitalization in their financial activity also. Thus, this study becomes essential due to several reasons. Firstly, this study extends the limited research on evaluating the DFS awareness of MSMEs. Secondly, this is one of the earliest studies highlighting DFS usage, their most preferred DFS platform, and their reasons for adopting DFS. Thirdly, this study also reveals how different demographic factors of owners/managers affect the decision to adopt DFS in business. Lastly, this research can be helpful to small entrepreneurs, the government, and other institutions extending support to small entrepreneurs.

Literature Review

MSME Sector

The MSME sector is the most discussed topic in recent times. Government organizations and private entities in developing and developed nations have conducted many studies to uplift the MSMEs. However, every country has a different definition of micro, small, and medium enterprises (Chege & Wang, 2020). In India, MSME refers to business units registered under the MSMED Act, 2006. Micro-enterprises have investments in plants and machinery up to INR 1 cr and a turnover of up to INR 5 cr. Small enterprises have an investment in plant and machinery of up to INR 10 CR and turnover of up to INR 50 CR. Medium enterprises have an investment in plant and machinery of up to INR 50 CR and a turnover of up to INR 250 CR. MSMEs are the backbone of the economy, yet they are subject to external shocks, such as financial crises, natural catastrophes, and forced business environment changes (Shinozaki & Rao, 2021).

Financial Constraints of MSMEs

In the past literature, various factors have been discussed which cause financial constraints to MSMEs (Ayyagari et al., 2011). The most discussed reason is asymmetric information (Saifurrahman & Kassim, 2022) and transaction costs (Priyanath & Premaratne, 2015). Information asymmetry means that one party possesses more knowledge compared to another. Information asymmetry causes ethical risk and adverse selection problems, which make small businesses more vulnerable (Saifurrahman & Kassim, 2022). Information asymmetry and transaction costs are minimized if technology is adopted in businesses.

From a bank perspective, providing financial services to MSMEs, compared to larger companies, involves higher costs and risks (De la Torre et al., 2010). MSMEs have fewer assets and lower credit scores, making them high-risk customers to banks (Shang et al., 2020). As per Nemoto and Yoshino (2019), from a cost perspective, providing financial services involves high operational costs, such as customer acquisition, due diligence, regulatory compliance, credit risk analysis, and document processing. Thus, MSMEs are high-risk customers from a bank perspective. However, with the help of digital technologies and innovative business models, the finance gap in MSMEs can be filled (Kotishwar, 2018; Lyons & Kass-Hanna, 2020).

Adoption of DFS by MSMEs

Due to a lack of resources and small size, any processes or activities followed by MSMEs are very different from large firms (Gerschewski et al., 2020). Also, acceptance of any technology or decision-making process in small businesses is highly complex (Okřęglicka et al., 2015) as not only firm-level variables but also owner-specific

variables influence the level of acceptance (Baker et al., 2018). Also, MSMEs innovate more informally compared to large firms, as there is no strategic framework or planning (Anggadwita et al., 2017). In developing nations, MSMEs are more locally bound and depend strongly on their immediate institutional environment (Kraus et al., 2012). Thus, any technology adoption or upgradation calls for integrating different technological and organizational knowledge (Dabić et al., 2020).

Further, technological initiatives such as adopting digital financial services for the small-scale or MSME sector need to be more region-focused than large firms (Terjesen et al., 2016). Technology adoption in MSMEs is very complex. The process of learning does not occur with just knowledge accumulation in isolation. It is a combined effort of industry and policymakers (Bharati & Chaudhury, 2012). Reference groups and social influence play an important role in adopting any new technology (Gupta & Barua, 2016). Policymakers also play a significant role in the case of MSMEs. Uncertainty surrounding the costs and benefits of adoption must be reduced, asymmetric information on the value of the innovation must be clear, and skill requirements must be fulfilled (Banik, 2013) to improve the adoption level of any new technology.

Non-availability of skilled staff is also a barrier to technology adoption in MSMEs. As per Nanda et al. (2020), firms with skilled workforce adopt technology much faster than other firms, as a highly skilled workforce leads to sustainable organization growth (Rekha et al., 2020). Further, a lack of expertise and experience discourages people from using online services (Malkawi & Rumman, 2016). Thus, the following hypothesis has been formulated:

↪ **H1** : The Indian MSMEs' DFS awareness and adoption are well below the needed level.

Impact of the Demographic Variable on DFS Adoption

As MSMEs are typically run by a few people wearing many hats (Hally, 2016), owners'/managers' demographic variables (Baker et al., 2018), such as age, educational qualification, and experience, play an important role while making any business decision. Also, as per Rasheed and Siddiqui (2019), the human capital of an SME, such as the owner/manager, has a significant determinant in predicting the financing preferences of SMEs. Also, human capital can be measured using three variables, namely age, education, and experience (Baker et al., 2018). Therefore, in this research paper, we have tried to analyze the direct impact of age, education, and experience of owner/manager on the adoption of DFS. Thus, the following hypotheses are formulated:

↪ **H2** : The age of the owner/manager significantly impacts DFS adoption.

↪ **H3** : The education of the owner/manager significantly impacts DFS adoption.

↪ **H4** : The experience of the owner/manager has a significant impact on DFS adoption.

Research Methodology

Instrument Development

Methodology refers to the study design, strategies, procedures, and approaches employed in a well-planned investigation to make discoveries (Daniel & Harland, 2017). It is quantitative research for which an instrument is developed. The instrument was developed based on past literature given in Table 3. The instrument consisted of 16 questions, which were divided into three parts. The first part covered demographic and socioeconomic variables of age, gender, education level, and experience in the current business. The second part identified questions

related to DFS awareness and the reason for adopting DFS. Finally, the third part was devoted to DFS adoption in various financial activities, using six 5-point Likert scales ranging from 1 (*least used*) to 5 (*most used*). The questionnaire source is given in Table 3, and a detailed questionnaire is shown in the Appendix.

Validity and Reliability of the Instrument

The validity of the instrument was tested by taking subject expert opinions and conducting a pilot study with 50 respondents. The participants were asked to evaluate the questionnaire and share their opinions about the relevance of the given questions. Before conducting the survey, the questionnaire was modified to the best extent possible. The questionnaire was also tested for reliability using Cronbach's alpha. The results of Cronbach's alpha indicate that an instrument is reliable if alpha values are above 0.70. There are 16 items in the questionnaire. The combined alpha value of the instrument is 0.861, and the alpha value of the individual variable is given in Table 3, which indicates that the instrument is reliable.

Sampling and Data Collection

Data Collection

The data for this research paper were collected from the owners/managers of the MSMEs in the Shahdara Industrial Area situated in the National Capital of India, that is, New Delhi. The data were collected during the pandemic to evaluate the influence of COVID-19, i.e., from December 2020 – February 2021. Our data was random, although we used a non-random data collection method. Snowball sampling was used for collecting responses; 200 respondents were sent the online questionnaires via Google forms. With 115 owners/managers of MSMEs completing the questionnaire, 57.5 % of the total population responded to the questionnaire.

Sample Size

The population of the Shahdara Industrial Area, as per the Udyog Aadhaar MSME registration dashboard, is 3,151. Therefore, the appropriate sample size was calculated where alpha was 0.05, t was 1.96, and the margin of error was 0.03. As registered MSME units were 3,151, the appropriate sample size ranged between 112 and 119 for a population between 2,000–4,000. As a result, we collected 115 valid responses for the study, which is appropriate for further data analysis.

Table 3. Source of the Questionnaire and Reliability Score

Variables	Number of Items	Cronbach's Alpha	Source
Behavior for adopting technology	2	0.860	Rogers et al. (2014)
Usage and understanding of DFS	5		Global Partnership for
Usage of DFS through mobile applications			Financial Inclusion (2020)
			Hassan & Meraj (2019)
Usage of DFS in different business activities	5	0.924	Ernst & Young (2019)

Data Analysis and Results

The analysis combines descriptive and inferential statistics via the statistical software SPSS (version 21). Descriptive analyses, such as frequency distribution, percentage analysis, and mean scores, are used to understand the DFS knowledge, awareness, and understanding of preferable DFS platforms, payment systems, and mobile applications of respondents. Based on the specified purpose of the study and the research questions, hypothesis H1 will be tested informally with descriptive statistics, whereas the other three hypotheses will be tested with an ordinal logistic regression model. Ordinal logistic regression is used to understand the impact of age, education, and experience on DFS adoption.

Ordinal logistic regression was applied, and the assumptions of the data were verified. Ordinal logistic regression predicts an ordinal dependent variable given one or more independent variables. The first assumption of ordinal regression is that the dependent variable is measured on an ordinal level. The second assumption is that one or more independent variables are either continuous, categorical, or ordinal. The third assumption is the non-existence of multi-collinearity, and the last assumption is proportional odds.

Demographic Profile of the Respondents

Table 4 provides descriptive statistics for the respondents' demographic profiles. About 3.5% were 20 – 30 years

Table 4. Respondents' Characteristics

Characteristics	Value	Number	(%)
Gender	Female	95	82.6
	Male	20	17.4
Age	20 – 30 years	4	3.5
	31 – 40 years	44	38.3
	41 – 50 years	42	36.5
	51 – 60 years	16	13.9
	61 or more	09	7.8
Educational Level	No formal education	7	6.1
	Senior secondary graduate	51	44.3
	Vocational diploma	6	5.2
	Postgraduate	49	42.6
	PhD	2	1.7
Experience	Less than 3 years	6	5.2
	3 – 6 years	12	10.4
	6 – 9 years	34	29.6
	9 – 12 years	33	28.7
	12 or more	30	26.1
Behavior for Adopting Technology	Non-adopter	9	7.8
	Moderate adopter	60	52.2
	Early adopter	46	40.0

old, 44% were 31 – 40 years old, 42% were 41–50, 16% were 51–60 years old, and the remaining 9% were 61 or more. Moreover, 82.6% were males, and 17.4% were female respondents. As for the respondents' highest level of education, 6.1% had no formal education, 44.3% were senior secondary graduates, 5.2% held a vocational diploma, 42.6% held postgraduate degrees, and only 1.7% were doctorate degree holders. In addition, about 5.2% of the respondents had less than 3 years of experience in current business, 10.4% had 3–6 years of experience, 29.6% had 6–9 years of experience, and 28.7% had 9–12 years of experience, whereas 26.1% held experience of more than 12 years.

Analysis of the Awareness Level of Digital Financial Services Among MSMEs

DFS Usage of Respondents

Respondents were asked whether their DFS usage had increased after COVID-19 (Table 5). As per the respondents, only 46.1% increased their DFS usage. A maximum of 62 (53.9%) respondents worked as they did before the pandemic.

DFS Knowledge of the Respondents

The respondents were asked to rate their level of DFS knowledge (Table 6). The maximum number of respondents with basic knowledge of DFS is 48 (41.7%). However, only 30 (26.1%) and 15 (13%) respondents considered their DFS understanding high and very high. These results show the technology skill gap in the MSME sector (Dar & Mishra, 2021).

Analysis of MSME Preference and Acceptance Toward Digital Financial Services

The key reasons for adopting DFS (Table 7), awareness of different DFS payment systems (Table 8), and platforms of respondents (Table 9) are analyzed with the following questions:

Table 5. Usage of DFS in Business

Usage of DFS	Number	%
Increased	53	46.1
Not changed	62	53.9
Total	115	100

Table 6. Level of Understanding of DFS

Understanding of DFS	Number	%
Very low	8	7.0
Low	14	12.2
Basic	48	41.7
High	30	26.1
Very high	15	13.0
Total	115	100.0

Table 7. Which Among the Following is the Most Preferred Reason for Adopting DFS?

Platforms of DFS	Number	%
Accessible	41	35.7
Speedy transactions	19	16.5
Saves time	47	40.9
Transparency in services	7	6.1
Convenient over cash	1	.9
Total	115	100.0

Table 8. What is the Most Used DFS Payment System?

Payment System	Number	%
IMPS	36	31.3
RuPay Cards	16	13.9
UPI	58	50.4
NACH	0	0
Aadhaar enabled Payment	5	4.4
USSD	0	0
Total	115	100.0

Table 9. Usage of DFS Platforms in Business

Different Platforms of DFS	Yes	%	No	%
Internet Banking	72	61.7	44	38.3
Point of Sale	34	29.6	81	70.4
Banking Cards	50	43.7	65	56.5
Mobile Wallet	80	69.6	35	30.4
Micro ATM	43	37.4	72	62.6
Mobile Banking	95	82.6	20	17.4

Key Reasons for Adopting DFS

The respondents were asked about their preferred reason for adopting DFS over traditional financial services. Of the four options given, time-saving emerged as the most pointed out reason, with 47 (40.9%) respondents. Accessible from anywhere has been the second reason for DFS adoption, with 41 (35.7%) respondents. Speedy transactions, which is also an important reason for the adoption of DFS, was opted for by 19 (16.5%) respondents. Only 7 (6.1%) respondents opted for transparency and convenience over cash, and 1 (0.9%) respondent cited IT-related risk and IT frauds as the reason for the same.

NPCI has rolled out a variety of payment system products. UPI (50.4%) is the most used digital payment system among the respondents. On the other hand, NACH and USSD are not opted for by a single respondent, which shows that awareness of DFS is not as required.

Table 10. Most Preferred Mobile Application

Mobile Applications	Number	%
Google Pay	28	24.3
Paytm	34	29.6
Phone Pay	42	36.6
Mobiwik	11	9.5
Total	115	100.0

The most used DFS platform by respondents is mobile banking (82.6%). Internet banking (61.7%), banking cards (43.7%), and mobile wallets (69.6%) are also popular among MSMEs. Cashbacks and coupons could be the reason for choosing mobile wallets and banking cards. Point of sale (29.6%) and micro ATMs (37.4%) are the least used DFS platforms.

Also, Phone Pay (36.5%) is the preferable UPI mobile application among the respondents, followed by Paytm (29.6%) and Google Pay (24.3%). The data has been referred to in Table 10.

Adoption of Different DFS Financial Activities by the Respondents

After evaluating the awareness of different platforms of DFS, the adoption of DFS among MSMEs in various financial activities is assessed (Table 11). Respondents were asked to rate the adoption of given financial activities in their business. The generosity of consistency toward financing activity is denoted from 1–5 (5 denotes *most used*, while 1 denotes *least used*). In addition, the following criteria are used for the analysis:

- ↪ The mean score between 1.00–1.80 means very less used,
- ↪ The mean score between 1.80–2.60 means less used,
- ↪ The mean score between 2.60–3.40 means neutral,
- ↪ The mean score between 3.40–4.20 means used,
- ↪ The mean score between 4.20–5.00 means most used (Motwani et al., 2014; Streijl et al., 2016).

Most of the respondents were taking insurance digitally. Also, payments and receivables were being increasingly transferred digitally after COVID-19 in B2B transactions. Still, loans and advances were least used by respondents through digital means. Also, the salary/wages of laborers/workers were transferred through digital

Table 11. Adoption of DFS in Different Financial Activities

Financial Activities	Least Used (1)	(2)	(3)	(4)	Most Used (5)	Mean
Digital payments and receivables	0.9	4.3	9.6	61.7	23.5	4.03
Digital capital raising	2.6	4.3	13.0	47.0	33.0	4.03
Digital investment	0	6.1	16.5	47.0	30.4	4.02
Digital insurance	0.9	6.1	20.0	35.7	37.4	4.03
Digital lending	1.7	7.0	21.7	32.2	37.4	3.97
Digital payment of salary to staff	0.9	4.3	11.3	24.3	59.1	4.37

Table 12. Results of Ordinal Logistic Regression

Characteristics	Value	Beta	sig.	R ²	-2log likelihood	Chi-Square
Age	Non-adopter	-6.458	0.000*	0.273	41.231	24.079
	Moderate adopter	-2.822	0.000*			
Education	Non-adopter	-.440	0.434	0.173	47.380	33.870
	Moderate adopter	2.786	0.000*			
Experience	Non-adopter	-4.895	0.000*	0.131	38.599	15.269
	Moderate adopter	-1.782	.007*			

Note. *Link Function: Logit.

*Significant at a 5% level of confidence.

means, which was given in cash earlier. Therefore, although MSMEs adopted simple DFS transactions, they were hesitant to adopt advanced DFS transactions such as digital lending and digital capital raising. Thus, we can reject the alternate hypothesis (H1), where the Indian MSMEs' DFS awareness and adoption are well below the needed level, as MSMEs accept DFS much faster, primarily through mobile banking.

Analysis of the Effect of Demographic Variables on DFS Adoption

The respondents are classified into three groups: non-adopters, early adopters, and moderate adopters (Rogers et al., 2014) for DFS adoption. The DFS adoption is used in the ordinal logistic regression model as the dependent variable, which is explained simultaneously by all independent variables.

The logistic regression was used to identify the impact of each independent variable: age, the highest level of education, and experience in current business on DFS adoption. The reference category is early adopters. Table 12 summarizes the results of the logistic regression. Among the respondents, 7.8% considered themselves as non-adopters, 52.2% were moderate adopters, and the remaining 40% were early adopters. Table 12 also shows the chi-square values, indicating that the model has high explanatory power.

The age coefficient is damaging and statistically significant at a 5% level in the non-adopter and moderate adopter groups; thus, we accept the alternative hypothesis (H2). In the case of education, the coefficient is negative plus non-significant in the case of non-adopters and positive plus statistically significant at a 5% level in the case of the moderate adopter category. Thus, the alternate hypothesis (H3) is rejected. Finally, the coefficient of experience is negative and statistically significant in both categories at a 5% confidence level. Accordingly, we accept the alternate hypothesis (H4).

Conclusion

“Digital transformation will benefit everyone” (Claudia & Mihaela, 2020). The research findings can be briefed as follows:

The DFS awareness among the MSME sector is high but far from the needed level. Time-saving (40.9%) and accessibility (35.7%) are the primary reasons for adopting DFS. UPI is the preferred payment system, and Phone Pay is MSMEs' most used mobile application. Digital insurance and digital payment services were well-known and popular among the respondents. Demonetization and COVID-19 (Agur et al., 2020) also increased the awareness of DFS among Indian MSMEs, but adoption is temporary.

Prior studies (Ogubazghi & Muturi, 2014) revealed that demographic characteristics, such as age, education,

and experience in current business in the context of owner/manager influenced the attitude toward financial product usage and adoption, which is proven in the present study also. In our study, DFS adoption is affected by the age and experience of the owner/manager. The study contributes theoretically to the existing literature of Rogers et al. (2014), which explains that any new idea or innovation's core resource is human capital.

The first step toward digitalization is being organized. To be more organized, MSMEs should have standard procedures and protocols. The benefits of digitalization, artificial intelligence, and big data can only occur if they adopt standard procedures and protocols. Another important thing is that small businesses must eliminate the concept of low-cost indigenous solutions. Instead, relatively real-time issues should be addressed, which is the adoption of innovative solutions.

Theoretical and Managerial Implications

Theoretical Implications

The study's results support the past literature stating that MSME is moving toward digitalization but slowly (Nemoto & Yoshino, 2019 ; Shinozaki & Rao, 2021). Further, the results showcase that MSMEs are still apprehensive about implementing DFS, which echoes the need for innovative financial products (Hari Krishna & Arun Kumar, 2020) customized to MSMEs' needs. The study's results support the past literature, stating that MSMEs are adopting DFS through smartphones (Navena Nesa Kumari et al., 2021; Singh & Srivastava, 2018; Thakur & Srivastava, 2014). Thus, policymakers should make a reliable internet ecosystem and telecommunication system to encourage mobile payments.

Managerial Implications

The study has some critical managerial implications. Firstly, the results show that most Indian MSMEs are still in the emerging stage of technology. The awareness about DFS in the MSME sector is high, but the adoption rate is low. MSMEs are very much aware of the advantages of DFS as the majority of respondents in this study believe that DFS is easy to use, can be done from any location, and saves time. However, MSMEs still hesitate to adopt DFS in all aspects of their business. Thus, to draw small firms, digital financial service providers should boost client satisfaction and ease administrative burdens. Secondly, by making their website or application user-friendly, digital financial service providers may make things easier for MSMEs. The results show that regardless of how inventive the service providers are, MSMEs are worried about a lack of consumer protection and financial losses brought on by process or system failures or security breaches. As a result, to increase the number of DFS users, digital financial service providers must enhance their reputation by showcasing the dependability and trustworthiness of their systems.

Thirdly, COVID-19 and the resultant lockdown caused a spike in DFS (Mohania & Mainrai, 2020). Established firms are moving toward DFS much faster (Shinozaki & Rao, 2021), which can also be seen in our study. Businesses operating for 9–12 years in current business have adopted DFS. They are categorized as moderate adopters, and new businesses having experience of fewer than three years are categorized as early adopters. There are many benefits of DFS, such as cost, speed, transparency, and convenience (Agur et al., 2020), to which respondents also agreed. Lastly, to increase the adoption of DFS among MSMEs, government support (Belitz & Lejpras, 2016; Ilori et al., 2017; Padachi et al., 2018) is required as there is a requirement for a robust digital infrastructure base with data protection and cyber risk management. Further, skill development is one of the significant issues in any technological advancement. Thus, government intervention is a must, specifically in the unorganized sector of MSMEs.

Limitations of the Study and Scope for Future Research

The study has some limitations that can be addressed in further research. A study of a similar nature can be carried out with a larger sample size. Secondly, the technology skill gap in MSMEs can be analyzed in future studies. Thirdly, a more intricate model can be created by including other variables, such as risk-taking, innovativeness, proactiveness, peer influence, and government support.

Authors' Contribution

Upasana Gupta created the idea and qualitative design to conduct the empirical investigation. Dr. Bhawna Agarwal retrieved reputable research papers, used keywords to filter them, and completed concepts and questionnaires relevant to the study's design. Dr. Bhawna Agarwal supervised the study and confirmed the analytical techniques. Upasana Gupta conducted the interviews in English. Dr. Bhawna Agarwal used SPSS 26.0 to perform the numerical calculations. Finally, Upasana Gupta, in collaboration with Dr. Bhawna Agarwal, wrote the manuscript.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or the entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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References

- Agur, I., Peria, S. M., & Rochon, C. (2020). Digital financial services and the pandemic: Opportunities and risks for emerging and developing economies. *International Monetary Fund Special Series on COVID-19, Transactions, 1*, https://www.imf.org/~media/Files/Publications/covid19-special-notes/en-special-series-on-covid-19-digital-financial-services-and-the-pandemic.ashx?la=en&utm_medium=email&utm_source=govdelivery
- Agyapong, D. (2010). Micro, small and medium enterprises' activities, income level and poverty reduction in Ghana – A synthesis of related literature. *International Journal of Business and Management, 5*(12), 196–205. <https://doi.org/10.5539/ijbm.v5n12p196>
- Anggadwita, G., Luturlean, B. S., Ramadani, V., & Ratten, V. (2017). Socio-cultural environments and emerging economy entrepreneurship: Women entrepreneurs in Indonesia. *Journal of Entrepreneurship in Emerging Economies, 9*(1), 85–96. <https://doi.org/10.1108/JEEE-03-2016-0011>
- Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2011). *Small vs. young firms across the world: Contribution to employment, job creation, and growth*. <https://ssrn.com/abstract=1807732>

- Baker, H. K., Kumar, S., & Singh, H. P. (2018). Behavioural biases among SME owners. *International Journal of Management Practice*, 11(3), 259–283. <https://doi.org/10.1504/IJMP.2018.092867>
- Banik, A. (2013). *From adoption to innovation: The dynamics of Indian knowledge firms' technology learning*. Available at SSRN. <https://ssrn.com/abstract=2271102>
- Basri, S., & Shetty, D. (2018). Predicting E-banking adoption: An evaluation of perception and behavioural intentions of small and medium enterprises in Karnataka. *Indian Journal of Finance*, 12(7), 28–41. <https://doi.org/10.17010/ijf/2018/v12i7/129969>
- Belitz, H., & Lejpras, A. (2016). Financing patterns of R&D in small and medium-sized enterprises and the perception of innovation barriers in Germany. *Science and Public Policy*, 43(2), 245–261. <https://doi.org/10.1093/scipol/scv027>
- Bharati, P., & Chaudhury, A. (2012). Technology assimilation across the value chain: An empirical study of small and medium-sized enterprises. *Information Resources Management Journal (IRMJ)*, 25(1), 38–60. <https://doi.org/10.4018/irmj.2012010103>
- Chege, S. M., & Wang, D. (2020). Information technology innovation and its impact on job creation by SMEs in developing countries: An analysis of the literature review. *Technology Analysis & Strategic Management*, 32(3), 256–271. <https://doi.org/10.1080/09537325.2019.1651263>
- Claudia, O., & Mihaela, H. (2020). Digital transformation of Centru region – Romania. Needs assessment. *Studies in Business and Economics*, 15(2), 270–281. <https://doi.org/10.2478/sbe-2020-0040>
- Dabić, M., Maley, J., Dana, L.-P., Novak, I., Pellegrini, M. M., & Caputo, A. (2020). Pathways of SME internationalization: A bibliometric and systematic review. *Small Business Economics*, 55, 705–725. <https://doi.org/10.1007/s11187-019-00181-6>
- Daniel, B. K., & Harland, T. (2017). *Higher education research methodology: A step-by-step guide to the research process* (1st ed.). Routledge. <https://doi.org/10.4324/9781315149783>
- Dar, I. A., & Mishra, M. (2021). Human capital and SMEs internationalization: Development and validation of a measurement scale. *Global Business Review*, 22(3), 718–734. <https://doi.org/10.1177/0972150918817390>
- De la Torre, A., Peria, M. S., & Schmukler, S. L. (2010). Bank involvement with SMEs: Beyond relationship lending. *Journal of Banking & Finance*, 34(9), 2280–2293. <https://doi.org/10.1016/j.jbankfin.2010.02.014>
- Ernst & Young. (2019). *EY global FinTech Adoption Index, 2019*. https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/banking-and-capital-markets/ey-global-fintech-adoption-index.pdf
- Gerschewski, S., Evers, N., Nguyen, A. T., & Froese, F. J. (2020). Trade shows and SME internationalisation: Networking for performance. *Management International Review*, 60, 573–595. <https://doi.org/10.1007/s11575-020-00421-0079>
- Global Partnership for Financial Inclusion. (2020). *Promoting digital and innovative SME financing*. World Bank Group. https://www.gpfi.org/sites/gpfi/files/saudi_digitalSME.pdf
- Gupta, H., & Barua, M. K. (2016). Identifying enablers of technological innovation for Indian MSMEs using best–worst multi criteria decision making method. *Technological Forecasting and Social Change*, 107, 69–79. <https://doi.org/10.1016/j.techfore.2016.03.028>

- Hakeem, M. M. (2019). Innovative solutions to tap “Micro, Small and Medium Enterprises” (MSME) market: A way forward for Islamic banks. *Islamic Economic Studies*, 27(1), 38–52. <https://doi.org/10.1108/IES-05-2019-0002>
- Hally, L. (2016). FinTech solutions for small businesses. In, S. Chishti & J. Barberis (eds.), *The fintech book: The financial technology handbook for investors, entrepreneurs and visionaries*. Wiley. <https://doi.org/10.1002/9781119218906.ch32>
- Hari Krishna, B., & Arun Kumar, A. (2020). FinTech, BigTech and banks: Digitalisation and its impact on banking business models. *Indian Journal of Finance*, 14(5–7), 76–79. <https://doi.org/10.17010/ijf/2020/v14i5-7/153326>
- Hassan, M., & Meraj, Q. F. (2019). *Digital financial services: Initiatives and progress with reference to banking industry: Evidence from India*. <https://dx.doi.org/10.2139/ssrn.3319894>
- Ilori, A. B., Lawal, A., & Simeon-Oke, O. O. (2017). Innovations and innovation capability in palm kernel processing industry in Southwestern Nigeria. *International Journal of Innovation Science*, 9(1), 102–114. <https://doi.org/10.1108/IJIS-10-2016-0045>
- Indrawati, H., Caska, & Suarman. (2020). Barriers to technological innovations of SMEs: How to solve them? *International Journal of Innovation Science*, 12(5), 545–564. <https://doi.org/10.1108/IJIS-04-2020-0049>
- Kaka, N., Madgavkar, A., Kshirsagar, A., Gupta, R., Manyika, J., Bahl, K., & Gupta, S. (2019). *Digital India: Technology to transform a connected nation*. McKinsey Global Institute. <https://www.mckinsey.com/mckinsey-digital/our-insights/digital-india-technology-to-transform-a-connected-nation>
- Kotishwar, A. (2018). Impact of digitalization on select banks. *Indian Journal of Finance*, 12(12), 32–51. <https://doi.org/10.17010/ijf/2018/v12i12/139890>
- Kraus, S., Rigtering, J. P., Hughes, M., & Hosman, V. (2012). Entrepreneurial orientation and the business performance of SMEs: A quantitative study from the Netherlands. *Review of Managerial Science*, 6, 161–182. <https://doi.org/10.1007/s11846-011-0062-9>
- Lyons, A. C., & Kass-Hanna, J. (2020). *Rebuilding the livelihoods of forcibly displaced populations using digital financial inclusion*. T20 Saudi Arabia Policy Brief. https://www.g20-insights.org/wp-content/uploads/2020/11/T20_TF6_PB7.pdf
- Malkawi, M. S., & Rumman, A. A. (2016). Knowledge management capabilities and its impact on product innovation in SME's. *International Business Research*, 9(5), 76–85. <https://doi.org/10.5539/ibr.v9n5p76>
- Ministry of Micro, Small and Medium Enterprises. (2021). *Annual report 2020–21*. <https://msme.gov.in/sites/default/files/MSMEENGLISHANNUALREPORT2021-22.pdf>
- Mohania, S., & Mainrai, G. (2020). The COVID-19 pandemic and its impact on the banking industry – A case of national bank Ltd. *Indian Journal of Finance*, 14(8–9), 80–89. <https://doi.org/10.17010/ijf/2020/v14i8-9/154950>
- Motwani, D., Shrimali, D., & Agarwal, K. (2014). Customer's attitude towards social media marketing. *SSRN Electronic Journal*. <https://ssrn.com/abstract=2438187>

- Nanda, T., Gupta, H., Singh, T. P., Kusi-Sarpong, S., Jabbour, C. J., & Cherri, A. (2020). An original framework for strategic technology development of small manufacturing enterprises in emerging economies. *Benchmarking: An International Journal*, 27(2), 781–816. <https://doi.org/10.1108/BIJ-02-2019-0074>
- Navena Nesa Kumari, J., Joe Arun, C., & Irudaya Veni Mary, A. (2021). Mobile payment technology adoption in SME owners in India – An empirical study. *Indian Journal of Finance*, 15(1), 36–54. <https://doi.org/10.17010/ijf/2021/v15i1/157013>
- Nemoto, N., & Yoshino, N. (2019). *Fintech for Asian SMEs*. Asian Development Bank Institute. <http://hdl.handle.net/11540/10203>
- NPCI. (n.d.). *UPI product statistics*. <https://www.npci.org.in/what-we-do/upi/product-statistics>
- Ogubazghi, S. K., & Muturi, W. (2014). The effect of age and educational level of owner/managers on SMMEs' access to bank loan in Eritrea: Evidence from Asmara City. *American Journal of Industrial and Business Management*, 4(11), 632–643. <http://doi.org/10.4236/ajibm.2014.411069>
- Okřęglicka, M., Gorzeń-Mitka, I., & Ogorean, C. (2015). Management challenges in the context of a complex view-SMEs perspective. *Procedia Economics and Finance*, 34, 445–452. [https://doi.org/10.1016/S2212-5671\(15\)01653-6](https://doi.org/10.1016/S2212-5671(15)01653-6)
- Padachi, K., Narrainen, D., & Boolaky, A. (2018). Prototyping an innovative e-platform of financial assistance for small medium enterprises in Mauritius. *African Journal of Business Management*, 12(13), 415–427. <https://doi.org/10.5897/AJBM2018.8572>
- Pazarbasioglu, C., Mora, A. G., Uttamchandani, M., Natarajan, H., Feyen, E., & Saal, M. (2020). *Digital financial services*. World Bank. <https://pubdocs.worldbank.org/en/230281588169110691/Digital-Financial-Services.pdf>
- Priyanath, H. M., & Premaratne, S. P. (2015). Government SME development programs in Sri Lanka: A review in the lens of transaction cost economics. *Sabaragamuwa University Journal*, 13(2), 59–81. <http://doi.org/10.4038/suslj.v13i2.7681>
- PWC. (2014). *Future of India: The winning leap*. <https://www.pwc.com/sg/en/publications/assets/future-of-india-the-winning-leap.pdf>
- Rasheed, R., & Siddiqui, S. H. (2019). Attitude for inclusive finance: Influence of owner-managers' and firms' characteristics on SMEs financial decision making. *Journal of Economic and Administrative Sciences*, 35(3), 158–171. <https://doi.org/10.1108/JEAS-05-2018-0057>
- Rekha, I. S., Basri, S., & Kavitha, T. C. (2020). Acceptance of internet banking: Comparing six theoretical models. *Indian Journal of Finance*, 14(3), 7–21. <https://doi.org/10.17010/ijf/2020/v14i3/151073>
- Rogers, E. M., Singhal, A., & Quinlan, M. M. (2014). Diffusion of innovations. In, *An integrated approach to communication theory and research* (pp. 432–448). Routledge.
- Saifurrahman, A., & Kassim, S. (2022). Collateral imposition and financial inclusion: A case study among Islamic banks and MSMEs in Indonesia. *Islamic Economic Studies*, 30(1), 42–63. <https://doi.org/10.1108/IES-04-2022-0023>

- Setiawan, B., Nugraha, D. P., Irawan, A., Nathan, R. J., & Zoltan, Z. (2021). User innovativeness and fintech adoption in Indonesia. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(3), 188. <https://doi.org/10.3390/joitmc7030188>
- Shang, Q., Ma, Z., & Wang, X. (2020). In search of the best interest rate for group lending: Toward a win-win solution for SMEs and commercial banks in China. *The Chinese Economy*, 53(3), 285–299. <https://doi.org/10.1080/10971475.2020.1722359>
- Shinozaki, S., & Rao, L. N. (2021). *COVID-19 impact on micro, small, and medium-sized enterprises under the lockdown: Evidence from a rapid survey in the Philippines* (ADBI Working Paper Series No. 1216). <https://www.adb.org/sites/default/files/publication/677321/adbi-wp1216.pdf>
- Sim, S. S., Yip, M. Y., Wang, Z., Tan, A. C., Tan, G. S., Cheung, C. M., Chakravarthy, U. M., Wong, T. Y., Teo, K. Y., & Ting, D. S. (2021). Digital technology for AMD management in the post-COVID-19 new normal. *Asia-Pacific Journal of Ophthalmology*, 10(1), 39–48. <http://doi.org/10.1097/APO.0000000000000363>
- Singh, S., & Srivastava, R. K. (2018). Predicting the intention to use mobile banking in India. *International Journal of Bank Marketing*, 36(2), 357–378. <https://doi.org/10.1108/IJBM-12-2016-0>
- Streijl, R. C., Winkler, S., & Hands, D. S. (2016). Mean opinion score (MOS) revisited: Methods and applications, limitations and alternatives. *Multimedia Systems*, 22, 213–227. <https://doi.org/10.1007/s00530-014-0446-1>
- Terjesen, S., Hessels, J., & Li, D. (2016). Comparative international entrepreneurship: A review and research agenda. *Journal of Management*, 42(1), 299–344. <https://doi.org/10.1177/0149206313486259>
- Thakur, R., & Srivastava, M. (2014). Adoption readiness, personal innovativeness, perceived risk and usage intention across customer groups for mobile payment services in India. *Internet Research*, 24(3), 362–392. <https://doi.org/10.1108/IntR-12-2012-0244>
- Tomar, J. S. (2017). State of IT adoption in SMEs in India. *Prabandhan: Indian Journal of Management*, 10(1), 40–53. <https://doi.org/10.17010/pijom/2017/v10i1/109102>

Appendix.

Table A. Detailed Questionnaire

Constructs	Questions	Source
Respondents' Profile	Name	Demographic Variables
	Gender	
	Age	
	Education	
	Experience	
Technology Adopting Behavior	What is the behavior for adopting any new technology?	Rogers et al. (2014)
	Does COVID-19 and the resultant lockdown increase the usage of DFS in business?	Sim et al. (2021)
Usage and understanding of DFS ;	Level of understanding of DFS	Global Partnership for Financial Inclusion, 2020
Usage of DFS through mobile applications	Which among the following is the most preferred reason for adopting DFS?	
	What is the most used DFS payment system?	Hassan & Meraj (2019)
	Usage of different DFS platforms in the business:	
	Internet banking	
	Point of sale	
	Banking cards	
	Mobile wallet	
	Micro ATM	
	Mobile banking	Ernst & Young (2019)
	Most preferred mobile application in business	
Rate the level of adoption of financial technology in the given financial activities, where five is the most used, and one is the least used in business		
Financial Activity	Receipts and payments	
	Borrowings	
	Savings	
	Insurance	
	Financial planning	

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