Digital Payments System in India and Its Scope in The Post-Pandemic Era

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1.INTRODUCTION

India is predominantly a cash-based economy where apprehensions of going digital, perennially persist. According to a report by Credit Suisse Group AG, 72% of India's consumer transactions take place in cash, double the rate as in China. Nevertheless, a paradigm shift was observed when India announced demonetization on 8th November 2016, announcing all five hundred and one thousand rupees banknotes as redundant, effective midnight. An unsolicited push gave birth to the new economy that strives for digital inclusion and sees rapid expansion year on year. As of November 2019, India had over 115.5 crore wireless telephone subscribers resulting in a tele density of 88.90%. (Reserve Bank of India, 2020). This increase in smartphone devices has supported this growth and adoption of various digital means of payment.

Digital payments will increase employment, reduce risks related to cash like corruption, robbery, and carrying large amounts of cash, helping people to transfer the money with security and safety at high speed. (Pandey, A., & Rathore, A. S., 2018). Cash is King, but Digital is Divine. An inevitable movement towards digitalization makes understanding digital payments not only extremely interesting but a dynamic study.

The pandemic has unlocked the need of adopting digital modes more than ever with social distancing gaining prime importance and the uncertainty of its end driving this need furthermore. The motivation behind this study stems from this ever-evolving subject going through another big change since 2016, with a desire to explore the perspective of the masses towards the new normal and their expectations regarding digital payments in the same.

2. LITERATURE REVIEW

2.1 Key points are tabulated by the author after performing research on contemporary literature surrounding the topic of the study to gain deeper insights and elucidate the gap identified:

SR. NO.	AUTHOR	TITLE	ALTERNATIVES (suggestions/ findings)	CRITICISM (inadequacies)	COMMENTS
1	Sivathanu, B. (2019)	A Study on Penetration of Digital Payment System in Selected Areas of Rural Karnataka.	Like Pulse Polio Campaign, the Digital India Campaign should be carried out nationwide for digital literacy.	Findings were not displayed systematically.	Great insight on rural mindset and DPS (Digital Payment System). Though it would vary with the geography, the emotion is more or less understood.
2	Sahayaselvi, S. (2017)	An Overview on Digital Payments.	Government could give concessions to the retailers, merchants and other suppliers who sell the products and services via digital mode and to encourage e-merchants.	Clarity in concept was lacking in distinction between different payment modes and their examples.	The flow of information should be uniform throughout the literature which could have been worked on.
3	Agarwal, S., Ghosh, P., Li, J., & Ruan, T. (2019)	Digital Payments Induce Over-Spending: Evidence from the 2016	Interesting suggestion that the move from cash towards digital payments could have an unintended consequence	Income level seems to be ignored while determining cash dependencies which is	Refreshing take on Demonetisation with interesting results.

		Demonetization in India.	of encouraging people to overspend.	a highly influential factor.	
4	Husain, A. (2012)	Cashless transaction systems: A study of paradigm shift in Indian consumer behaviour.	Role of government is crucial in reinforcing the cashless transaction system in India.	Sample size was small; hence the outcome cannot be generalised.	Elaborate research methodology makes the paper clear and insightful.
5	Pandey, A., & Rathore, A. S. (2018)	Impact and importance of digital payment in india.	Issue of literacy to be tackled in order to see success of a digitised India.	Lack of primary data to validate the results of objectives undertaken	Individual measures of adopting e-money can be explored beyond government responsibilities
6	Baghla, A. (2018)	A study on the future of digital payments in India.	Survey Indicates lack of trust and existence of fear in digital payments- Hacking and other cybercrimes to be significant.	Though the right terms targeted, the number of questions asked was very less and the sample size too small	Current types of systems in use are concisely explained
7	Chandarana, N. (2015)	Payments Bank- A need of Digital India.	The decision to license some of the country's biggest corporate and mobile telecom firms to start payment banks promises to be a similar game-changer in India.	Conclusions drawn seems vague against the evidence provided.	Objectives are explored accurately.
8	Gochhwal, R. (2017).	Unified Payment Interface—An Advancement in Payment Systems.	Believes that UPI can be a great enabler for financial inclusion in India and allow a huge set of population to be a part of the digital economy.	As it is a statistic forward paper, a lot of conclusions are derived from 2017 and hence see a scope of revision.	Systematic and commendable exploration of objectives.
9	Goriparthi, R. K., & Tiwari, P.	Demonetization in India an Era for Digital Payments.	Estimates that ~80-90% of that unaccounted money would be invested in physical assets while the cash part would be ~10-20%.	A steady flow was missing in the comprehensive nature of information provided	The impact of demonetisation is well studied and put forward.
10	Jain Senior Assistant Professor, C.	Digital Payments and Demonetisation.	Suggests that it will take some more time for people from age group 45-70 years in adapting. Banks can launch special digital promotion programmes for people of this age group.	Extremely small sample size and selection. Vague conclusion drawn.	Derivations drawn from survey are done systematically
11	Kamatchi Eswaran, K.	Consumer Perception towards digital payment modes with special reference to digital wallets.	It was found that demographic factors except education do not have much impact on the adoption of the digital payment.	Respondents were skewed in gender demographic making assumptions on gender less accurate as compared to other variables picked.	Overall variables studied seemed well thought of.
12	Suma, K., & Hema Divya, K. (2018).	A study on digital payments in India with perspective of consumer adoption.	Deployment of technology for digital payments have improved the performance of the banking sector and able to achieve the motive cash less country.	Sample was taken out of 1 city hence correlations identified may vary.	Similar studies conducted in different parts of the country on the same hypothesis can add to value to generalising the derivations.

13	Vikas, D., & Kumar, A. A. (2018)	What Indians Think About Paytm.	Found out the highest correlation value of 0.903 was related to without internet Paytm cannot work.	Unequal amounts of factors were picked for pros and cons.	Decent conclusions were drawn, and the topic of study was quite interesting.
14	Gupta, K. P., Manrai, R., & Goel, U. (2019)	Factors influencing adoption of payments banks by Indian customers.	Results suggest that the behavioral intention (BI) to use and innovation resistance (IR) affect the usage of digital payment systems.	The research was portrayed in an extremely intricate manner which tends to lose reader's attention and understanding	offers valuable insights to the economists, policymakers, and digital payment service providers regarding the usage of digital payment systems by consumers during demonetization.
15	Jain, P. (2017)	Cashless system of colleges in India.	College administrator's view indicates 86% of the government. college administrators and 67% private college administrators expressed their easiness with the cashless system	The variables picked were very subjective, the study could have expanded on the same.	A balanced sample was taken for the survey.
16	Klapper, L. (2017)	How digital payments can benefit entrepreneurs.	Digital payments give women entrepreneurs greater control over their income, potentially benefiting their entire household, especially children.	The data available to researchers and policymakers on digital payment flows, especially measurements of merchant payments, are lacking, making the study less inclusive of these factors.	Only secondary data was used
17	Kristensen, L.-B. K., & Solvoll, M. (2019)	Digital payments for a digital generation.	The paper argues that one of the reasons for the increased use of Facebook as a news source is the introduc- tion of digital subscriptions by local online newspapers. Another	Only focused on the traditional printed media, books and local newspapers, and more work needs to be under- taken in comparative media studies	Great sample size as funding was provided and the research was a part of a larger project.
18	Adharsh, R., Harikrishnan, J., Prasad, A., & Venugopal, J. S. (2018)	Transformation towards E-Wallet Payment Systems Pertaining to Indian Youth.	Concluded 2/3rd of the youth today use E-wallets mainly for online transactions, recharges, booking tickets.	A campus wide survey was taken which is highly inadequate on generalising the Youth.	It is a simple and Understandable literature, available e-wallets are explained well.
19	Kumar, V., Dalal, S., Mani, M., & Jambheshwar, G., Jitendra Singh, Mahesh Kumar Chaubey (2019)	Business Management and Social Innovation-Predicting Digital Payment: An Indian Perspective	Unprecedented growth trend witnessed in the month of May and June in the year 2017 and 2018 and heading towards seasonal growth.	Only secondary data was used to make predictions.	Systematic division of topics while talking about- types, benefits, and challenges
20	Kumar, S. N., & Puttanna, K. (2018)	Payments transition in India – Consumer preferences and policy shifts	Reduced supply of currency notes has provided impetus to the Indian public to move towards digital platforms, and the increased supply of currency notes thereafter has not led to complete reversal	Secondary data was used for deducing conclusions, nevertheless it satisfied the objectives undertaken.	Payment System Categories under the RBI

			of this shift in this change in consumer preference.		
21	Amarnani, N., & Amarnani, A. (2019)	Digital Payments: Increasing Significance in the INdian Context	Suggests lack of conclusive evidence as to the long-term shift in payment methods, more so because of the disproportionately large contribution of the informal sector to the Indian economy.	The discussion does justice to the objectives undertaken by the author, no explicit inadequacy is visible.	Alternate perspectives of the data analysed is given.
22	Al-Ahdal, W. M., Farhan, N. H. S., Tabash, M. I., & Prusty, T. (2018).	The impact of demonetization on indian firms' performance: Does company's age make a difference?	Found no significant difference among the three groups at 5% level of significance, which means that the demonetization process had an impact on all the companies, irrespective of their age.	Number of companies in the groups that examine the age factor is not equal	Variables to be included in the future studies that examine the impact of demonetization or financial disruption on firm's performance.
23	Gupta, S., & Kumar, D. (n.d.)	UPI-An Innovative Step for making digital payments effective and consumer perception on unified payment interface.	If they have the same requirements as large banks and to our digital connect with the consumer through the mobile, it would truly tough to achieve a different level of scale	A study of the gold and foreign exchange fluctuations can be studied separately to gauge the impact of demonetisation and the banking sector's move.	A data-centric secondary source report.
24	Pal, J., Chandra, P., Kameswaran, V., Parameshwar, A., Joshi, S., & Johri, A. (2018)	Digital payment and its discontents: Street shops and the indian government's push for cashless transactions.	200 shopkeepers in Mumbai and Bengaluru found that cash shortage increased digital payment adoption but that digital payments fell after new banknotes became available.	Product type by the shopkeepers was heavily inclined towards apparel and accessories which in reality are lesser than food and other categories.	Sample size chosen feels adequate and the cities are metropolitan ones therefore giving a diverse opinion.
25	Shanker Chaubey, D. (2017)	Demonetisation and its impact on adoption of digital payment: Opportunities, Issues, Challenges	Digital payment has given relief and force to learn digital transactions after demonetization. People have adopted technology slowly, but do not want to pay extra for digital transactions. However,	The objectives of the paper were vast and required a more detailed exploration.	Reliability analysis was carried out and found to be 0.932

2.1 Literature Analysis

Existing literature studied by the author highlights the key findings by dividing it into three segments for easier interpretation of the summary, these are-

2.1.1 Understanding the Digital Payment Systems

Several papers, journal articles, and reports cover the various options of payments available to the Indian population, of which one such is by Baghla, A. (2018) in A study on the future of digital payments in India, proving to be a notable mention as the division of content is clear and the explanation is easy and in absorbable terms.

A few more that make this division easy include Adharsh, R., Harikrishnan, J., Prasad, A., & Venugopal, J. S. (2018) in Transformation towards E-Wallet Payment Systems Pertaining to Indian Youth who expand the types of e-wallets available and Kumar, S. N., & Puttanna, K. (2018) in Payments transition in India – Consumer preferences and policy shifts who efficiently talk about the various payment category systems under the RBI.

2.1.2 Exploring Consumer Adoption Pattern

Among studies deducing the adoption of these digital payment systems, Kamatchi Eswaran, 2019 in her

study on consumer preferences found that demographic factors except education does not have much impact on the adoption of digital payment. She took into consideration several significant variables as- Gender, Education, Profession, and more.

Jain Senior Assistant Professor, C. in Digital Payments and Demonetisation concluded from his study incorporating the age factor as well stating that it would take a much longer time for people from the age group 45-70 years in learning or changing the old habits of payment only through cash. Banks can launch special digital promotion programs for people of this age group.

Another well-written literature on understanding adoption is via the consumer perception of the Paytm application by Vikas, D., & Kumar, A. A. (2018) in What Indians Think About Paytm where he observed the highest correlation value of 0.903, discussing the cons of digital payments, was received by "Paytm wouldn't work without the internet". This indicates that a major psychological drawback to adoption is the lack of confidence in the availability of a stable network, which is not an issue while operating in cash.

Pal, J., Chandra, P. Kameswaran, V. Parameshwar (2018) surveyed about 200 storeowners across Mumbai and Bangalore in Digital payment and its discontents: Street shops and the indian government's push for cashless transactions. A majority said that the adoption of digital means is easier if a family member was tech-savvy and hoped that the government helped them understand it personally.

2.1.3 Discussion on growth of acceptance

Sivathanu, B. (2019). Adoption of digital payment systems in the era of demonetization in India: An empirical study gave a course of action in order to accelerate adoption- Similar to Pulse Polio Campaign, it was suggested that a Digital India Campaign should be carried out nationwide, on a mass scale 2-3 times a year as a significant method to proliferate the advanced India crusade both in rural and urban region alike.

With a lot of literature talking about the government's responsibility in this growth, Sahayaselvi, S. (2017) in An Overview on Digital Payments provides a suggestion that the Government could give concession to the retailers, merchants and other suppliers who sell the products and services online and this, in turn, will encourage all the merchants to become e-merchants and motivate them to actively spread the word.

Lastly, an affirmation by Chandarana, N. (2015) in Payment Banks- A digital need of India is that the decision to license some of the country's biggest corporate and mobile telecom firms (list provided in his research) to start payment banks promises to be game-changer in India and is evidently proving to be true looking at the success of the airtel payments bank and others.

3. RESEARCH GAP

Various studies have covered different aspects of the relationship between consumers and the digital payments system in India. Owing to the volatile nature of the title of this paper, there is a gap established in learning the expectations that people hold for the future, taking into account the global crisis that is affecting all countries and their economies alike.

As this is a much newer topic of discussion, no literature as such has been published along the lines of this specific topic as of the preparation of this paper. Hence, this study is a foot forward in the direction of fulfilling this gap for further fellow enthusiasts to take forth.

4. RESEARCH OBJECTIVES

This paper aims to-

1. Understand briefly, the various means of digital payment options available in the market currently.
2. Employ a survey to gauge consumer adoption of these options and their expectations regarding the same in the post-pandemic times.
3. Derive a meaningful qualitative analysis of the survey results that provide a base for future findings in the realm of consumer behavior towards digital payments.

5. SCOPE OF THE STUDY

Considering the literature reviewed and structure planned for this paper, undertaking similar surveys in the future will help draw a comparative analysis, exploring factors that will shape the expectations of people with time.

a. A study can be done when a vaccine is introduced and mass distributed.
b. The next phase can be another survey, 5-10 years down the line, to obtain a fresh set of values that

have the potential to observe a significant shift in consumer perception.

These will polish the objectives of this paper and add greater value to it, ultimately ensuring that the effort put in this study ages well.

6. HYPOTHESIS FORMATION

6.1 The objective of the study directs us to understand the effect of a pandemic on the adoption of digital payments in India, so as to understand its scope. Considering the fact that more and more modes of operations as well as transactions seem to be shifting online, and people being guided to stay inside their homes, it is only fitting to assume that this phenomenon pushed greater usage of digital payments systems hereby. Hence, the following hypothesis is formed:

H1: The Pandemic has led to an increase in the adoption of digital payments in India.

6.2 A Pandemic signals a need for extreme precautions, especially one that is as contagious and continually spreading as the Covid-19. With constant government advice and that of medical institutions, people are pushed to develop a mentality of strict hygiene as well as the notice of social distancing playing a key role in curbing the spread. Therefore, a natural reaction would be to avoid cash as it is harder to either distance or stay sanitized thereby increasing risks.

H2: Hygiene concerns in handling are a significant factor in accelerating the adoption of digital payments during the pandemic.

6.3 As aforementioned, with multiple activities and financial transactions on the rise, more hackers and fraud companies have come into the news for online scams relating to the usage of credit and debit cards and also suspicious mails hacking into digital wallets. Therefore, to establish security concern as a significant factor in this study, the following hypothesis is formed:

H3: Greater security concerns exist as the pandemic takes a large number of activities online.

7. RESEARCH METHODOLOGY

7.1 Research Type and Respondents

Primary data is collected for the purpose of this paper. A google form was created and circulated across various social media platforms in order to obtain the same. A total of 220 respondents participated in this study, displaying a balanced gender distribution with 50.9% female and 48.2% male (wherein 0.9% of the people preferred not to say).

53.6% fall in the age bracket of 18-24 and 35.9% are more than 40 years old, remaining percentages majorly fall in between 24-40.

In terms of educational qualification, 45% of them are pursuing graduation, 23.2% are graduates, 26.4% are post-graduates and 1.9% are Ph.D. holders. This survey was conducted in the month of September 2020 which is 6 months from the lockdown declared in lieu of the pandemic in India.

7.2 Research Design

Causal research is employed in order to find the cause-and-effect relationship between the occurrence of the pandemic and its impact on the adoption of digital payment systems in India. Also known as explanatory research, this causal study strives to determine a relationship between the existence of the pandemic and its impact on adoption while exploring key explanations for any relationship discovered such.

7.3 Questionnaire Design

The instrument used for this survey is a 5-point Likert scale-based questionnaire. A direct attitude measurement scale (Likert) was used in order to assess the intensity and direction of feelings that a respondent has towards the questions produced by the researcher. After a thorough review of the literature as well as an understanding of concepts, a 3-part questionnaire was developed-

1. The first part consisted of 4 demographic questions namely age, gender, educational qualification, and occupation. The anonymity of the participants was assured and providing their name was tagged as an optional field.
2. The second part consisted of questions to gauge the basic understanding of the respondents regarding digital payments, including but not limited to, the preferred mode of payments and the various types of digital payment modes they had the experience of using in the past.
3. The third part, and the section consisting of key variables, consisted of 9 questions related to the

usage of digital payments in the times of Covid-19 and their expectations in the post-pandemic time. These 9 questions were provided with a Likert scale to record the responses. The anchors selected for this scale were "Strongly Agree" and "Strongly Disagree". An open-ended question was provided in the end for the respondents to express other views that they deemed useful for the research in discussion. All the questions are listed section-wise in the appendix attached to the paper.

Cronbach's coefficient alpha value for the survey was calculated. The value alpha is found to be 0.74, which falls under the acceptable range (0.7-0.8). Therefore, the results of this research are reliable.

7.4 Sampling considerations

Population: For the purpose of this study, the population chosen is defined as people who have used digital payment systems at least once before the pandemic occurred.

Sample Size: A total of 220 participants are obtained to represent the aforementioned population.

Sampling Frame: The sampling frame hereby is vast and henceforth a non-probability sampling technique is used in order to derive as many responses as within abilities.

Sampling method: Purposive sampling (a type of non-probability sampling) is undertaken for this paper. Also known as deliberate sampling, it assesses the requirements of the study and deliberately chooses the respondents based on their background and its alignment with the research objectives. Students in universities across India, Corporate employees from reputed organizations, housewives from families engaging in regular usage of digital payment modes were sent the questionnaire to fill as they represent broad categories of the population of this survey.

Sampling unit: Every element thus obtained via the discussed method is now considered a sampling unit for further analysis of the objective.

Sampling error: Sampling error refers to how much different samples vary and the statistical confidence that can be placed in them. Considering the fact that this survey is using a Likert scale or attitude measurement scale that gathers qualitative data and a purposive sampling method utilized, 'Selection sampling error' possesses the highest chance of occurrence. Selection error can be controlled by extensively revising lists of participants of the study to ensure the right people are chosen for the same, the research has hereby.

7.5 Variables

The independent variable in the study is the onset of the pandemic while the dependent variables are the participants' responses towards the various elements introduced- Hygiene factor, Security concerns, etc. as seen in the questionnaire.

7.6 Tools used for analysis

Cronbach's coefficient alpha value for reliability, the measures of central tendency and dispersion- Mean, Variances, Standard Deviation, and Z-values are enumerated using Microsoft Excel.

8. DATA ANALYSIS & INTERPRETATION

The data collected from the responses are analyzed as two parts in the following manner for an organised analysis and a systematic interpretation:

a. The first part consists of the questions relating to the digital payment understanding of the participant.
b. The second part consists of Likert-scale-based questions and its thorough analysis leading to hypothesis verification.

8.1 Digital Payments Understanding of the Respondents

This section is included in the survey to develop a general understanding of the preferences and background of the participants in relation to their opinions regarding digital payment and the adoption of the various kinds of methods available in the market.

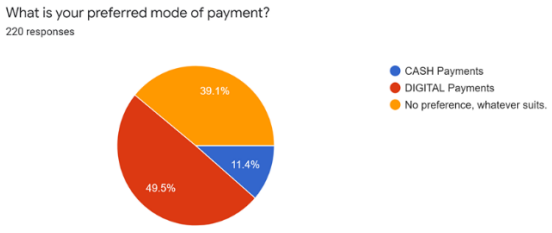


Fig 1: What is your preferred mode of payment?

Figure 1. We see that 49.5% of the respondents prefer digital modes of payment and 39.1% prefer cash, while 11.4% have no single preferred mode of payment.

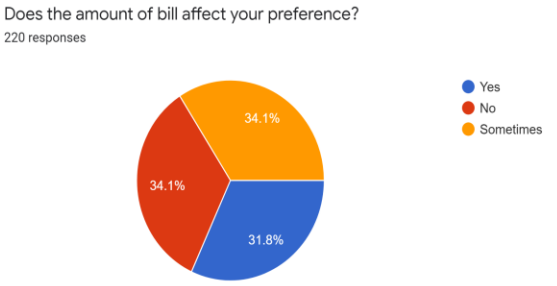


Fig 2: Does the amount of bill affect your preference?

Figure 2. Upon asking if the chosen mode of payment in the previous question is affected by the total amount of the bill an equal spread of opinion was seen. Where 34.1% of people said "Yes" and an equal number of people said "No" while 31.8% chose the option "Sometimes".

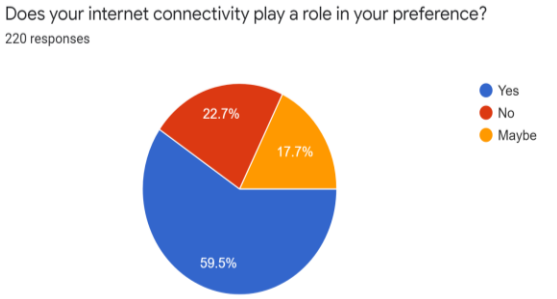


Fig 3: Does your internet connectivity play a role in your preference?

Figure 3. A majority, 59.5% of people believe that their internet connectivity plays a role in the preference they selected. While 22.7% think that the internet does not affect their preference and 17.7% opted for "Maybe"

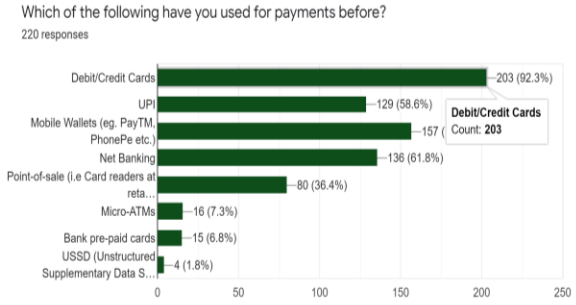


Fig 4: Which of the following methods have you used before?

Figure 4. In order to understand the current level of adoption of digital payment systems, all the digital modes of payment listed on the official government website (cashlessindia.gov.in) were displayed as checkboxes in the form. The above table shows the % of people that have used that mode at least once in their life. It is seen that Debit/Credit cards are the most popular methods (92.3%), followed by mobile wallets at (71.3%).

8.2 Analysis of the Likert-scale responses

In this section, the data collected from the questionnaire is analyzed as three tables and charts. The first one contains the frequency count for each question against all the anchor points of the measurement scale, each totaling the 220 collected responses.

8.2.1 The table below provides a concise overview of the raw data collected by the survey where the anchor points 'Strongly Disagree' and 'Strongly Agree' are the numerical values '1' and '5' respectively.

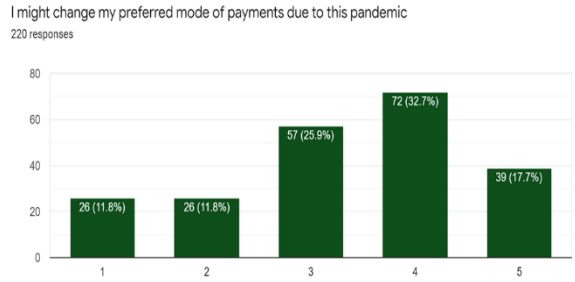
		Strongly Disagree				Strongly Agree	
Sr. No.	**Question**	**1**	**2**	**3**	**4**	**5**	**Total**
1	I might change my preferred mode of payments due to this pandemic	26	26	57	72	39	220
2	With everything going digital, I now have greater online security concerns	8	19	37	69	87	220
3	Hygiene factor in handling cash worries me	5	19	36	62	98	220
4	I see more stores accept digital payments now	3	7	26	72	112	220
5	Lately, I often buy my groceries online and pay digitally	17	33	42	61	67	220
6	I have stopped opting for Cash-On-Delivery while shopping online	13	31	48	49	79	220
7	Recently, I've started paying more of my bills online (electricity, cab fare etc.)	11	11	32	62	104	220
8	I feel more comfortable using digital payment options than before	6	15	34	71	94	220
9	Digital payment systems will gain more popularity because of the Covid-19 pandemic	5	3	23	51	138	220

Table 1. Frequency table of the questionnaire response

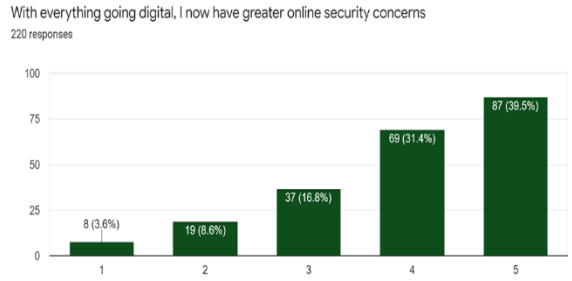
This table gives us an aerial view of the key data collected by the questionnaire and further enables calculations that help derive insights and validate the hypotheses formulated.

Following are the bar charts for each of the individual questions, after which an in-depth analysis would be done using mathematical formulas.

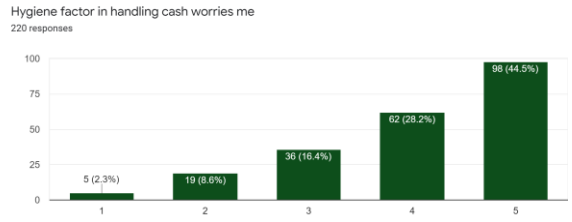
Question 1: I might change my preferred mode of payments during this pandemic-



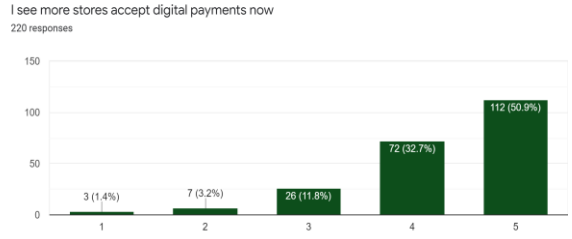
Question 2: With everything going digital, I have greater online security concerns now-



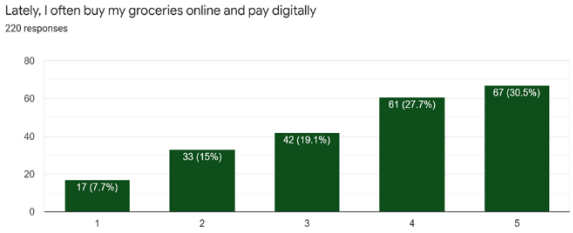
Question 3: Hygiene factor in handling cash worries me-



Question 4: I see more stores accept digital payments now-

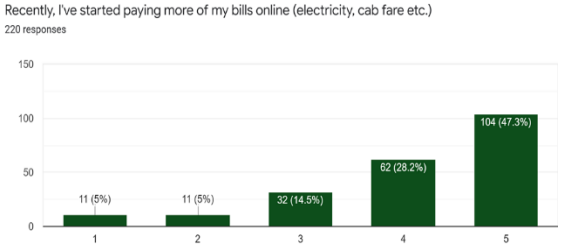


Question 5: Lately, I often buy my groceries online and pay digitally-

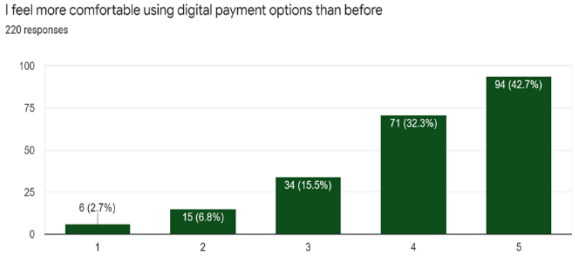


Question 6: I have stopped opting for Cash-on-Delivery while shopping online-

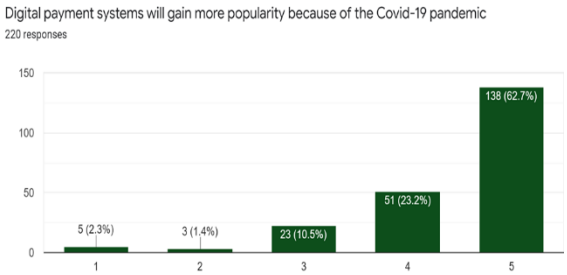
Question 7: Recently, I have started paying more of my bills online-



Question 8: I feel more comfortable using digital payment options than before-



Question 9: Digital payment systems will gain more popularity because of Covid-19-



8.2.2 The table given below calculates the Standard deviation, Variance and Z-value for each question in discussion:

Q. No.	Mean1 (x1)	Mean2 (x2)	S.D = $(x2-x1)^2$	Variance=$(S.D)^2$	z-value
1	3.33	12.59	3.04	9.3	0.11
2	3.95	16.80	3.59	12.9	0.26
3	4.04	17.49	3.67	13.4	0.28
4	4.29	19.17	3.86	14.9	0.33
5	3.58	14.45	3.30	10.9	0.18
6	3.68	15.13	3.38	11.4	0.20
7	4.08	17.89	3.72	13.8	0.29
8	4.05	17.54	3.67	13.5	0.29
9	4.43	20.41	4.00	16.0	0.36

Table 2. Standard Deviation, Variance and Z-values Table

Standard deviation: It defines how spread-apart the values are in a dataset. Here, it is calculated using the formula: (x2 - x1)2; where x1 is the mean of the weighted frequencies and x2 is the mean of weighted frequencies where the weights are squared. The weight hereby is the value of the Likert scale point (ie. "Strong Agree" is denoted by number 5 and is, therefore, the weight for that column). Being a 5-point scale, the values in the column show a tall graph and a higher concentration of values in a lower range.

Variance: It refers to the average of how much each data point has deviated from the mean. It is calculated by squaring the standard deviation values. All values for each question are given for the reference of the reader.

Z-value: It denotes the direction and intensity of the distance of the data from the mean value. A positive Z-value, as seen in all the questions of this survey, is indicative that the responses lie more towards the 'Agree' and 'Strongly Agree'. Each of the individual Z-values for the questions represents how distant they are from the 'Neutral' response. Higher positive values compared to the lower positives mean that the data is more toward 'Strongly Agree'.

8.2.3 The table shows the percentage responses for each of the points- Strong Disagree (SD), Disagree (D), Neutral (N), Agree (A) and Strongly Agree (SA):

Q. No.	S.D %	D%	N%	A%	S.A %
1	11.82	11.82	25.91	32.73	17.73
2	3.64	8.64	16.82	31.36	39.55
3	2.27	8.64	16.36	28.18	44.55
4	1.36	3.18	11.82	32.73	50.91
5	7.73	15.00	19.09	27.73	30.45
6	5.91	14.09	21.82	22.27	35.91
7	5.00	5.00	14.55	28.18	47.27
8	2.73	6.82	15.45	32.27	42.73
9	2.27	1.36	10.45	23.18	62.73

Fig. % Responses of the 5-points of the scale

As shown in the table above in question number two, 70.91% believe that they are worried about the hygiene factors involved in dealing with cash (31.36% Agree + 39.55% Strongly Agree). With 16.82% neutral about their opinion. With this data, along with the quantitative insights from Tables 1 and 2, it can be sufficiently derived that H2 is proved true.

Similarly, in question number three, 72.73% believe that they have greater security concerns as more things are going online due to the pandemic. Therefore, with a high percentage as well as taking into account the 16.36% neutral in opinion, and considering the variance derived, H3 is proved to be true.

Following the theme of this analysis, we see a whopping 85.91% believe that the usage of digital payments will rise in the future because of the pandemic. The majority of which (62.73%) strongly agree to the same. Hence, H1 is proven true.

9. DISCUSSIONS

Digital payments are on an onward path of adoption which is evidently sped up by the onset of the pandemic as the data gathered for this paper suggests. They are an undeniably convenient mode of monetary transactions that demands just a few prerequisites, excluding which are almost as easy as pressing a few buttons. It has created a culture of over-spending owing to this convenience (Agarwal, S., Ghosh, P., Li, J., & Ruan, T. 2019). The pandemic has definitely dented the spending intensity and frequency, but it surely would hop back to normal if not higher once things start to go back to normal.

With high concerns regarding the hygiene issues that adjoin the usage of cash, digital payments have surely received a great boost. Knowing the adoption patterns of any technological discovery, using develops comfort and ultimately, convenience becomes a habit. Hence despite the online security concerns, more people have started paying their bills online and discovered its convenience. This usage is bound to stick even when the pandemic is eradicated.

This paper consequently focused on the lesser discussed perspective of the causal evidence obtained between the pandemic and digital payment systems, in India.

10. CONCLUSION

To conclude, a unique and unprecedented event such as the pandemic in 2020 has impacted the digital payments system significantly and is probably a huge game-changer for India in digital payments adoption ever since the demonetization in 2016.

All three hypotheses postulated for this research have been proven to be true with several other insights that have been garnered along the way. The summaries and tables are open to individual interpretation and usage in several other future studies.

The author hopes that the scope of this may be explored further and thus the research be carried forward and polished by contemporaries across the world.

11. LIMITATIONS

An ever-changing situation such as the pandemic inherently restricts the research to the aforementioned time period in which it was conducted. The quantitative insights of the study provide crucial insights into the consumer preferences and adoption, but the qualitative approach to determining the questions asked, open up potential avenues for future studies.

The responses hereby are gathered solely from the residents of urban localities. Considering the rise in digital payments usage in the rural areas, this research would surely prove fruitful when undertaken in this urban counterpart. The demographic of the survey responses contains a majority from two age brackets, 18-24 and 40 plus, hence can be expanded to a higher number of middle-aged populations further.

12. MANAGERIAL IMPLICATIONS

This study is a testament to the importance of digital payments and its bright future that is destined to-be and is now accelerated owing to the pandemic. Considering this rise in the digital culture and the assumptions proven in the study, companies must begin allotting a greater budget to their Digital Marketing team and its expenses in order to truly capitalize on this set-to-succeed wave of digitalization that has captured the 21st century.

More and more retail stores must enable digital payment modes to stay relevant and avoid the overseeing of the huge market of consumers that prefer digital payments over cash, especially during these uncertain times of the pandemic and thereafter.

A great example of success and another proof for this research in the domain of marketing is the Cadbury Celebrations ad campaign for Diwali 2020. It is a beautifully executed ad that introduces the concept of 'Hyper-Personalised' marketing. Here, Cadbury creates a database of thousands of small businesses across India and promotes them in their area of an operation via an in-house algorithm. They helped many of these small businesses go online and set up their digital payment systems for them. A masterpiece of a campaign that highlights in this context, the importance of digital presence during the pandemic.

Similarly, several creative strategies can be produced keeping in mind the conclusions of this study and can be done so in fields beyond marketing as well.

And is ultimately a reassurance and a reminder for everyone to take parts of their business online and establish digital payment methods to ensure no potential customer is left behind.

APPENDIX

The Questionnaire in the discussion as mentioned is a 3-section form with the following questions:

SECTION 1- Demographic

1. Name (Optional)
2. Age
3. Gender
4. Educational qualification
5. Occupation

SECTION 2- Digital Payments Understanding

1. What is your preferred mode of payment?
2. Does the amount of bill affect your preference?
3. Does your internet connectivity play a role in your preference?
4. Which of the following have you used for payments before?

SECTION 3- Attitude Measurement

1. I might change my preferred mode of payments due to this pandemic.
2. With everything going digital, I now have greater online security concerns.
3. The hygiene factor in handling cash worries me.
4. I see more stores accept digital payments now.
5. Lately, I often buy my groceries online and pay digitally.

6. I have stopped opting for Cash-On-Delivery while shopping online.
7. Recently, I have started paying more of my bills online (electricity, cab fare etc.)
8. I feel more comfortable using digital payment options than before.
9. Digital payment systems will gain more popularity because of the Covid-19 pandemic.
10. Any other views you would like to contribute to this survey? (optional)

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