FINANCE AND BANKING

IJFB VOL 13 NO 1 (2023) P-ISSN 2574-6081 E-ISSN 2574-609X

Available online at https://www.cribfb.com
Journal homepage: https://www.cribfb.com/journal/index.php/ijfb
Published by CRIBFB, USA

INDIAN MOBILE BANKING IN POST COVID-19: AN ANALYTICAL STUDY AND GRATIFICATION FROM THE ASPECT OF KANO MODEL

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ARTICLE INFO

Article History:

Received: 4th November 2022
Revised: 28th December 2022
Accepted: 30th January 2023
Published: 7th February 2023

Keywords:

Virtual Banking, Gratification, Kano Model, Marketing Research Theory.

JEL Classification Codes:

A1, A30, C1, G17, Y8

ABSTRACT

The purpose of the present research paper is to understand the research questions related to M-banking. It is the time call to take up Virtual Banking (VB) with Zero Contact Banking (ZCB) as a preventive measure to COVID-19. The study also admits the comparative analysis on the gratification of M-banking users considering factors/attributes of the Kano Model. The researcher has undertaken Integrative Approach (IA) for both, related to literature reviewed and survey so far observed. Both primary data through well-structured questionnaires from 900 M-banking users of SBI, HDFC, and Citi Bank (300 from each) and secondary data from published sources have been cantered and cited to understand the syntactic research gap. The researcher has followed Stratified Random Sampling for sample banks considering the date of establishment, volume and value of M-banking transactions, number of employees, and Convenient Random Sampling for M-banking users, to make the sample representative. The objectives were studied thoroughly and hypotheses were tested in SPSS. The researcher has used Kolmogorov-Smirnov (D-Statistic) and Shapiro-Wilk test (W-Statistic) to test data normality, Cronbachs' Alpha to test Data Reliability, Descriptive Statistics i.e. frequency and per cent count to describe data and Chi-square to measure significant associations and differences if any. The researcher has drawn an epilogue purely on the basis of data collection and analysis. The researcher has conducted Pearson's Product Movement Correlation, to suggest a correlation on Y-intercept Model to show an association between volume and value of M-banking transactions of SBI, HDFC, and Citi Bank and suggested a model fit to regression equation. This paper gives a unique insight into KANO model.

INTRODUCTION

Technology has such a large influence on our lives that it is difficult to imagine a life without it. Innovations taking place all over the world in various fields have made our lives much easier and more relaxed. Mobile banking is characterized as "A channel whereby the customer interacts with a bank via a mobile device, such as a mobile phone or personal digital assistant.

Mobile banking has given users more flexibility in terms of time and space, which is also seen as a major drawback of traditional banking. It has also supported banks in lowering their operating costs and expanding their customer base. It has also aided banks in offering a variety of other related services to their existing customers at little or no cost. Due to the sheer size of its population, the number of internet users, the government's drive for financial inclusion, and public awareness of the ease and convenience of mobile banking, India's prospects for mobile banking appear to be very bright.

Banking Sector Reforms in 1991 and 1998, technological advancement, changes in banking policy and further initiative taken by Government of India i.e. the demonetization policy in November, 2016 and digital banking and its services have hit up the Indian banking industry and make them more tech-savvy. Further, the COVID-19 has pushed an economy towards physical, social and mental distancing, results into technological advancement and dependency and implementation of e-banking products and services such as plastic money i.e. Debit and credit card, RTGS, M-banking,

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https://doi.org/10.46281/ijfb.v13i1.1928

To cite this article: Jaywant, B., Nayan, R., Bhau, G. V., Singh, K., & Bharat, J. (2023). INDIAN MOBILE BANKING IN POST COVID-19: AN ANALYTICAL STUDY AND GRATIFICATION FROM THE ASPECT OF KANO MODEL. *Indian Journal of Finance and Banking*, *13*(1), 12-27. https://doi.org/10.46281/ijfb.v13i1.1928

NEFT etc. (Suoranta, 2003, Tiwari & Buse, 2007).

Mobile banking is characterized as "A channel whereby the customer interacts with a bank via a mobile device, such as a mobile phone or personal digital assistant" (Barnes & Corbitt, 2003). Mobile banking is a service provided by a bank or other financial institutions that allows its customers to conduct financial transactions from anywhere anytime geographically, using a mobile device such as a smartphone or tablet. Thus, Mobile banking has removed the difficulty of physical access to bank during COVID-19, provided flexibility to banking customers. Unlike internet banking, it uses software, usually called a mobile banking app, usually designed and backed by the financial institutions. As on 30th October, 2020; 542 banks (includes Public Sector Banks, Private Sector Banks, Foreign banks, Co-operative banks and Sahakari and Gramin banks) were permitted by RBI to provide Mobile Banking Services in India. Users of mobile banking have more flexibility in terms of time and space, which is sometimes overlooked. Assumed to be a major drawback of the traditional banking system. It has also aided banks in reducing costs. Lowering their operating costs and broadening their customer base (Cherian, Gaikar, Paul, & Pech, 2021).

Despite the benefits of mobile banking, there are many risks associated with it that must be taken into account. The most serious of these risks is the protection of mobile banking transactions, as both the internet and mobile transactions are vulnerable to phishing, account theft, and the leakage of sensitive information, among other things. Competition from mobile wallet companies such as Paytm, Phonepe, and others is another notable obstacle for mobile banking. For a variety of factors, two-thirds of online banking subscribers tend to use nonbanking companies' mobile wallets rather than their banks' mobile banking apps, according to one survey (Durkin, O'Donnell, Mullholland, & Crowe, 2007).

According to academic model, "Mobile Banking is a proviso and expediency of banking products and financial services with the help of mobile telecommunication devices". Thus, M-banking is a digital form of banking linked with a bank account to carry out banking financial transactions such as Account Balance Check, Fund Transfer, Request to Bank for Availing Various Banking Services, Online Shopping and Payments, Loans, Investments and Deposits, Mudra Loan etc. The rationale of the problem statement is available as follows:

COVID-19 has created panic and made society and people at mental, physical and social distance. The different banks are providing m-banking services on different platform offering disparate services to accountholders such as debit card add-on services, account check, investments and deposits, fund transfer, loan avail, m-passbook, mudra loan etc. Private and Foreign Banks were the foremost to adopt and implement technology in banking business, which has created competitive environment for public sector banks not only to satisfy existing banking customers but also to retain them for long adopting technological up gradation. Hence, there is a need to compare, explore and analyze the present research.

Following are the objectives of study:

- To study the meaning and use of mobile banking.
- To study about the demographic profile of mobile banking users SBI, HDFC and Citi Bank.
- To study about the gratification of mobile banking users SBI, ICICI and Citi Bank.
- To study the aftermath COVID-19 on m-banking use of SBI, ICICI and Citi Bank.

The significance of the study is as follows:

- The present research study will be helpful to understand the concept and use of M-banking use of SBI, HDFC and Citi Bank.
- It will be helpful to study the gratification of m-banking use of SBI, HDFC and Citi Bank only.
- It will be helpful to study the concept of impact of COVID-19 on M-banking use.
- The present research study will be helpful to examine and analyze the comparative M-banking use in terms of volume and value of SBI, HDFC and Citi Bank.
- The study will be useful to the bank to target M-banking users applying Artificial Intelligence (AI).

LITERATURE REVIEW

This literature review aims to investigate the most important contributions of the Kano methodology and in which way researchers have used, interpreted and modified the methodology of Kano at the same time how this model fits for the mobile banking. The discussions about use of WAP services in GSM mobile phones, which enables the users to interact with the bank to carry out internet – based content and advance value-added banking and financial services provided by bank (Cherian, Jacob, Qureshi, & Gaikar, 2020). The application-based m-banking and its studies showed how the internet banking has given rise to mobile banking, which includes facilities to conduct bank transactions, to administer accounts and to access customized information via internet using mobile based application (Durkin et al., 2007). Most of the Indian m-banking users are concerned about security issues like financial frauds and account misuse. To overcome these difficulties, the user uses different codes for banking transactions, installation and updating of application. Hence, lacks standardization. The mobile banking is defined as "The provision of banking services to customers on their mobile devices". It is the innovations in banking sector, which facilitates to carry out banking and other financial transactions with the help of mobile phones using internet (Laforet, & Li, 2005). The Mobile phone is an electronic channel capable of giving customers more low-cost service options such as access to banking information, funds management and making online payments. M-banking transactions are economical compared to the traditional banking channels. To gain in long term benefits, bank has to encourage m-banking services by specific mobile application and individual platform which plays major role in building brand loyalty (Matzler & Hinterhuber, 1998). Many empirical studies on electronic banking and mobile banking have applied TAM. For identifying the important drivers having a bearing on the mobile banking adoption intention of users. A few other studies have also used demographic variables along with the behavioral factors as drivers of technology adoption intention (Poddar, Erande, Chitkara, Bhansal, & Kejriwal, 2016). According to previous research, simplicity, access to the

service at any time and from any location, anonymity, and time and effort savings are all factors that contribute to mobile banking adoption (Reserve Bank of India, 2023, Zhao & Roy Dholakia, 2009).

MATERIALS AND METHODS

Research Framework: A Kano Model Approach

The model based on customer satisfaction, was developed by the Japanese Professor Noriaki Kano in 1984. This model seeks to explain how to assign the priorities to fulfill operational objectives, which results into long lasting improvements in customer service delivery (Zhao & Roy Dholakia, 2009). The Kano Model classifies the products and services knowledge, wants to and the nature and ways it leads to customers' satisfaction. The model divides product/service attributes into three categories; threshold or must be, performance and excitement or delighter. These attributes distinguish the product or services requirement, which has direct impact on their gratification (Saeidipour, Vatandost, & Akbari, 2012).

The Kano Model graphically shows the combination of two axis - the x axis and the y axis, the x axis defines the customer needs were met and to what extent; which is referred as a product/service performance or function and the y axis is defines the customer response to the product/service; whether the customer is delighted or disappointed. On the basis of this the customer expectations and its achievement are categories into three; Basic Needs, is called as "Must be Requirements", which are essential; if met customers are delighted and if not, they are disappointed and not preferred by them. Performance Needs, are define by customers and discussed by manufacturer, are called as "More is Better". This need makes product/services different from competitors. Attractive needs, the unspoken or unexpected needs which the customer cannot define. If such needs provided, they feel excited and if not remains neutral. Zhao & Dholakia using Kano model and multi-criteria decision models to evaluate the measurement of customer satisfaction (Sharma & Sharma, 2019).

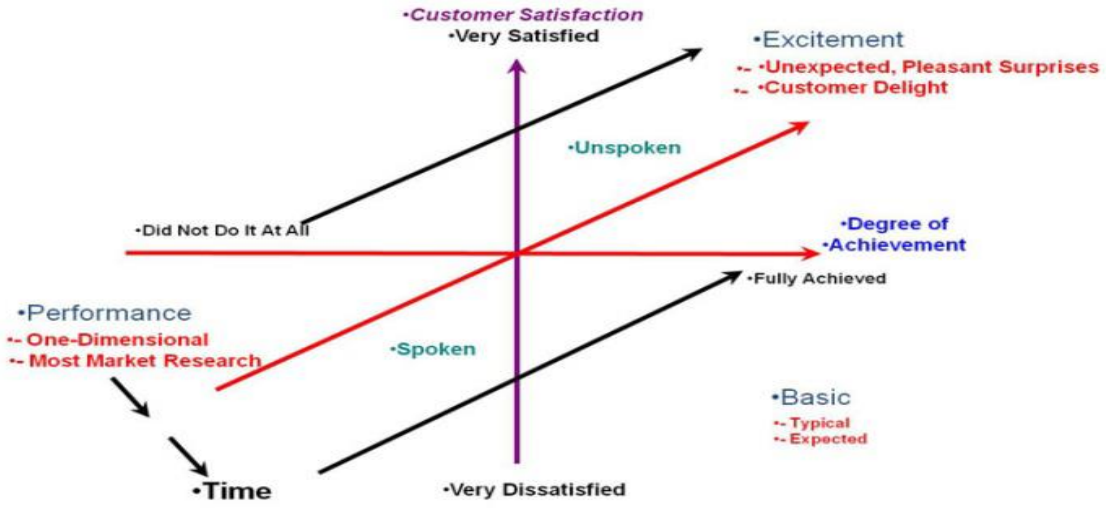

Figure 1. The Basic Kano Model

Thus, the Kano model is viewed in the perspective of mobile banking service via customer product/service delivery. In present research study, the researcher has thought-out mobile banking as one of the ways to interact with bank customers during COVID-19 in which physical and social distancing is must and hence measured and compared the gratification of SBI, HDFC and Citi Bank M-banking users with idiosyncrasy i.e. Basic Needs, Performance Requirements, Excitements Requirements, Neutral Attributes and Reverse Attributes (Sulaiman, Jaafar, & Mohezar, 2007).

Following are the hypotheses of the study:

The formulated affirmative statement in research study is called as hypothesis. It explains an association between two or more dependent and\or independent variable under study, which is tested using statistical tools and techniques and thereby study the objectives and to accept/reject the statements. The researcher has considered following hypotheses of the study. In the form of qualitative and quantitative hypotheses:

Qualitative Hypotheses

- **H_0:** There is no significant difference in gratification related to Basic Needs of mobile banking users of SBI, HDFC and Citi Bank.
- **H_0:** There is no significant difference in gratification related to Performance Requirements of mobile banking users of SBI, HDFC and Citi Bank.
- **H_0:** There is no significant difference in gratification related Excitement Requirements of mobile banking users of SBI, HDFC and Citi Bank.
- **H_0:** There is no significant difference in gratification related to Neutral Attributes of mobile banking users of SBI, HDFC and Citi Bank.

- **H_0:** There is no significant difference in gratification related to Reverse Attributes of mobile banking users of SBI, HDFC and Citi Bank.
- **H_0:** There is no association between demographic profile (gender, age, marital status, educational qualification, occupation and income level) and gratification (BPENR) of mobile banking users of SBI, HDFC and Citi Bank.
- **H_0:** There is no significant difference in prior experience of M-banking use.
- **H_0:** There is no significant difference in frequency of using M-banking services.

Quantitative Hypotheses

- **H_0:** There is no significant difference in volume (i.e. number) of m-banking transactions of SBI, HDFC and Citi Bank aftermath COVID-19. (H_0:$\mu vol_{SBI} = \mu vol_{HDFC} = \mu vol_{,Citi\ Bank}$)
- **H_0:** There is no significant difference in value (i.e. amount) of m-banking use of SBI, HDFC and Citi Bank aftermath COVID-19 (H_0: $\mu val_{SBI} = \mu val_{ICICI} = \mu val_{,Citi\ Bank}$)
- **H_0:** There is no association between volume and value of M-banking transactions of SBI, HDFC and Citi Bank.

Participant (Subject) Characteristics

The present research study is qualitative and quantitative in nature. The approach to the present research study is Particularistic. The research study is of exploratory and conclusive type. The universe and population for the present research study is public sector banks, Private Sector Banks and Foreign Banks in India. The respondents were Mobile banking users. The population for the present research study is verbal for mobile banking users and measurable for sample banks in terms of number of banks, its branches, volume and value of mobile banking and its use (Cherian, Jacob, Qureshi, & Gaikar, 2020).

The data for the present research study has been collected from 900 M-banking users of the SBI, HDFC and Citi Bank. For the present study the researcher has used Cochran's formula to determine the size of the sample of M-banking users. Cochran (1977) has developed a formula to determine the representative sample in both ways when population infinite and finite. Hence, for the present study the researcher has decided to apply both formulas considering Level of Precision, Confidence Level Desired and Degree of Variability to determine representative sample population for the present research study.

Sampling Procedures – Size, Power and Precision

Assuming large infinite population whose variability not known, assuming maximum variability i.e. 50% at p = 0.5 and taking 95% confidence level with ± 5 precision, the sample size for the present research study shall be 666. To study and probe into detail the researcher found such size of sample little less representative of population. Further, it is said that larger the size of sample, more the surety of their responses to truly represent the population. Thus, to buffer, the researcher has increased the total size of sample to 900 numbers of M-banking users in Mumbai city i.e. 300 M-banking users of each sample bank i.e. SBI, HDFC and Citi Bank respectively.

The sample banks were selected by Stratified Random Sampling. Three banks from each of the public sector, private sector and foreign banks have been selected considering their Date of Establishment, Volume and Value of Mobile Banking Use, Number of Working Branches\Offices and Number of employees.

Table 1. Details of sample bank as on 31st March, 2020 in India

Particular Head\Bank Name	SBI	HDFC	Citi Bank
Date of Establishment	July, 1955	August, 1994	June, 1902
Number\Volume of Mobile Banking (Actual)	322432111	120519634	1898161
Value\Amount of Mobile Banking (in Rs'000)	1054325130.37	696795439.29	43713103.50
Number of Branches\Offices	24000	4787	42
Number of Employees	249448	104154	204000

Source: Compiled and calculated from Secondary Source

It was found that the SBI, HDFC and Citi Bank lead in above criteria. Hence, Public Sector Bank - State Bank of India, Private Sector Bank - The Housing Development Finance Corporation Limited and Foreign Bank - Citi Bank has constituted the sample bank for the present research study. The primary and secondary data has been organized and anlysed to study the objectives and to test the hypotheses of the present research study. The researcher has collected primary data from actual mobile banking users of SBI, HDFC and Citi Bank. 300 actual M-banking users from each of the sample banks has been collected and reported.

Measures and Covariates

The researcher has collected secondary data related to mobile banking use from the published source the Reserve Bank of India (2023). The researcher has collected secondary data related to mobile banking use of SBI, HDFC Bank Ltd. and Citi Bank for aftermath, pre COVID-19 from November, 2019 to March, 2020 and post COVID-19 from April, 2020 to August, 2020. Primary data from the actual M-banking users and the secondary data from the published sources, by The Reserve Bank of India.

Just to balance the data the researcher has collected 5 months of pre (i.e. from November, 2019 to March, 2020) and 5 months of post (i.e. from April, 2020 to August, 2020) COVID-19 of each sample bank data related to mobile baking use in terms of volume and value has been cited and analyzed. The result of normality of data using Kolmogorov-Smirnov

and Shapiro-Wilk is as follows:

Table 2. Tests of Normality by Kolmogorov-Smirnov = (D) and Shapiro-Wilk = (W)

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
BN1	.228	900	.000	.889	900	.000
BN2	.253	900	.000	.877	900	.000
BN3	.216	900	.000	.890	900	.000
BN4	.248	900	.000	.871	900	.000
BN5	.252	900	.000	.861	900	.000
BN6	.247	900	.000	.861	900	.000
PR1	.201	900	.000	.901	900	.000
PR2	.260	900	.000	.874	900	.000
PR3	.223	900	.000	.892	900	.000
PR4	.261	900	.000	.869	900	.000
PR5	.259	900	.000	.851	900	.000
ER1	.228	900	.000	.889	900	.000
ER2	.253	900	.000	.877	900	.000
NA1	.223	900	.000	.888	900	.000
NA2	.256	900	.000	.872	900	.000
RA1	.261	900	.000	.862	900	.000
RA2	.248	900	.000	.871	900	.000
TOB	.223	900	.000	.793	900	.000
a. Lilliefors Significance Correction						

Source: Compiled and calculated from primary data

The researcher has considered variables to study, understand and compare gratification of M-banking use of sample bank. To verify whether all variable measure the same construct-scale, all variables are correlated and could form into some type of scaling, the Cronbach's Alpha - The Test of Reliability was conducted (Table 4).

Table 3. Reliability statistics of M-banking Use

Variable Head	Cronbach's Alpha	No of Items	Internal Consistency
Basic Needs	.864	06	Good Internal Consistency
Performance Requirements	.719	05	Acceptable Internal Consistency
Excitement Requirements	.598	02	Poor Internal Consistency
Neutral Attributes	.739	02	Acceptable Internal Consistency
Reverse Attributes	.544	02	Poor Internal Consistency
Overall Reliability	.729	17	Acceptable Internal Consistency (for all attributes)

Source: Compiled and calculated from primary data

The researchers applied SPSS 21 to study the objectives and to test the hypotheses of the present research. The researcher has used Kolmogorov-Smirnov and Shapiro -Wilk test of normality, to test data Normality. The researcher has used Cronbachs' Alpha, to test data Reliability. Descriptive Statistics-frequency and per cent count, Kruskal Wallis 1–Way ANOVA, Mean Rank, (to make gratification comparative), Chi-square test, Z-test (to calculate z-score to measure aftermath COVID-19 of M-banking use of sample bank).

RESULTS

To understand the behavior toward m-banking use, the respondents were asked questions based on their demographic profile and m-banking services by sample banks. Further, to measure their gratification, questions-based Likert Five Point Scale was asked and the same has been analyzed using descriptive statistics and inferential analysis as follow.
Descriptive analysis describes the collected data in logical order. The researcher has described data as follow:

Demographic Profile

Table 4. Demographic Profile

Demographic Head	Type of Bank			Total (900)	Total Per cent
	SBI	HDFC	Citi Bank		
Gender					
Male	98	97	105	300	33.33 %
Female	202	203	195	600	66.67 %
Female dominates the M-banking use among all three sample banks.					
Age					
Up to 25 Year	84	95	97	276	30.67 %

26 to 35 Year	90	84	82	256	28.44 %
36 to 45 Year	77	75	69	221	24.56 %
46 Year and Above	49	46	52	147	16.33 %
The age group up to 25 ears found to be highest number of M-banking users among all three sample banks.					
Education					
Graduation	59	60	65	184	20.44 %
Postgraduation	86	78	86	250	27.78 %
Diploma/Technical	46	46	43	135	15.00 %
Professional	76	82	70	228	25.33 %
Other	33	34	36	103	11.45 %
Postgraduation M-banking users are more in all three sample banks.					
Occupation					
Business	74	84	77	235	26.11 %
Government Employee	86	75	83	244	27.11 %
Private Employee	87	78	89	254	28.22 %
Professional	53	62	51	167	18.56 %
Most of the M-banking users are private employees.					
Monthly Income					
Up to Rs. 24999	87	89	88	264	29.33 %
Rs. 25000 to Rs. 49999	71	69	71	211	23.44 %
Rs. 50000 to Rs. 74999	81	84	85	250	27.78 %
Rs. 75000 and Above	61	58	56	175	19.45 %
M-banking users having monthly income up to Rs. 249999 found to be more.					
Prior Experience of Using M-banking					
Yes	175	183	180	538	59.78 %
No	125	117	120	362	40.22 %
Most of the M-banking users are having prior experience of using M-banking services.					
Frequency of Using M-banking					
Atleast once in a day	80	77	78	235	26.11 %
Once in 2 to 4 days	91	91	99	281	31. 22 %
Once in 5 to 7 days	96	93	87	276	30.67 %
Once in a fortnight	19	26	22	67	07.44 %
Once in a month	14	13	14	41	04.56 %
It is found that there is insignificant difference of using M-banking services between once in 2 to 4 days and once in 5 to 7 days.					

Source: Compiled and calculated from primary data

Inference from Analyses of Mobile Banking Use

To test and verify above hypothesis, the researcher has collected primary data from 900 respondents (300 from each) sample banks related to basic needs, performance requirements, excitement requirements, neutral attributes and reverse attributes. The researcher has also collected Pre (from November, 2019 to March, 2020) - Post (April, 2020 to August, 2020) COVID-19 monthly data related to volume and value of M-banking transactions of sample banks.

Analyses and Interpretations

Based On Qualitative Hypotheses

H_0: There is no significant difference in gratification related to Basic Needs of mobile banking users of SBI, HDFC and Citi Bank.

Table 5. Kruskal-Wallis 1-Way ANNOVA mean rank related to basic needs (BN)

	Ranks			Results/ Ranks
	TOB	**N**	**Mean Rank**	
BN1	SBI	300	470.25	1st
	HDFC	300	412.33	3rd
	Citi Bank	300	468.92	2nd
	Total	900		SBI bank dominates.
BN2	SBI	300	432.20	3rd
	HDFC	300	479.32	1st
	Citi Bank	300	439.98	2nd
	Total	900		HDFC bank dominates.
BN3	SBI	300	504.28	1st
	HDFC	300	416.00	3rd
	Citi Bank	300	431.22	2nd
	Total	900		SBI bank dominates.
BN4	SBI	300	462.82	1st
	HDFC	300	448.86	2nd
	Citi Bank	300	439.82	3rd
	Total	900		SBI bank dominates.
BN5	SBI	300	433.37	3rd
	HDFC	300	470.47	1st

	Citi Bank	300	447.66	2nd
	Total	900	HDFC bank dominates.	
BN6	SBI	300	444.64	3rd
	HDFC	300	445.06	2nd
	Citi Bank	300	461.81	1st
	Total	900	Citi Bank bank dominates.	

Source: Compiled and calculated from primary data

Table 6. Calculation of Chi-Square Value - to measure statistical significance difference in gratification related to basic needs (BN)

Test Statistics [a,b]						
	BN1	**BN2**	**BN3**	**BN4**	**BN5**	**BN6**
Chi-Square	10.485	6.220	21.091	1.294	3.372	.924
Df	2	2	2	2	2	2
Table Value	5.99	5.99	5.99	5.99	5.99	5.99
Asymp. Sig.	.005	.045	.000	.524	.185	.630
Results	$P(X^2(10.485) > 5.99) = .005 < 0.05$	$P(X^2(6.220) > 5.99) = .045 < 0.05$	$P(X^2(21.091) > 5.99) = .000 < 0.05$	$P(X^2(1.294) < 5.99) = .524 > 0.05$	$P(X^2(3.372) < 5.99) = .185 > 0.05$	$P(X^2(0.924) < 5.99) = .630 > 0.05$
Sig.\Insig.	Significant H_a Accepted	Significant H_a Accepted	Significant H_a Accepted	Not-Significant Fails to reject H_0	Not-Significant Fails to reject H_0	Not-Significant Fails to reject H_0

a. Kruskal Wallis Test b. Grouping Variable: TOB

Source: Compiled and calculated from primary data

The table above shows that the calculated Chi-square value is compared with its table value at a degree of freedom 2 and its significance value @ 5% level of significance. It shows either acceptance of H_a or failure to reject H_0

H_0: There is no significant difference in gratification related to Performance Requirements of mobile banking users of SBI, HDFC and Citi Bank.

Table 7. Kruskal-Wallis 1-Way ANNOVA mean rank related to performance requirements (PR)

Ranks				**Results/ Ranks**
	TOB	**N**	**Mean Rank**	
PR1	SBI	300	434.81	2nd
	HDFC	300	483.94	1st
	Citi Bank	300	432.75	3rd
	Total	900	HDFC bank dominates.	
PR2	SBI	300	467.89	1st
	HDFC	300	428.79	3rd
	Citi Bank	300	454.81	2nd
	Total	900	SBI bank dominates.	
PR3	SBI	300	438.22	3rd
	HDFC	300	470.35	1st
	Citi Bank	300	442.93	2nd
	Total	900	HDFC bank dominates.	
PR4	SBI	300	435.50	3rd
	HDFC	300	468.46	1st
	Citi Bank	300	447.54	2nd
	Total	900	HDFC bank dominates.	
PR5	SBI	300	443.81	3rd
	HDFC	300	450.36	2nd
	Citi Bank	300	457.34	1st
	Total	900	Citi Bank bank dominates.	

Source: Compiled and calculated from primary data

Table 8. Calculation of Chi-Square Value - to measure statistical significance difference in gratification related to Performance Requirements (PR)

Test Statistics a,b					
	PR1	PR2	PR3	PR4	PR5
Chi-Square	7.983	3.873	2.863	2.707	.443
Df	2	2	2	2	2
Table Value	5.99	5.99	5.99	5.99	5.99
Asymp. Sig.	.018	.144	.239	.258	.801
Results	$P(X^2(7.983) > 5.99) = .018 < 0.05$	$P(X^2(3.873) < 5.99) = .144 > 0.05$	$P(X^2(2.963) < 5.99) = .239 > 0.05$	$P(X^2(2.707) < 5.99) = .258 > 0.05$	$P(X^2(.443) < 5.99) = .801 > 0.05$
Sig.\Insig.	Significant H_a Accepted	Not-Significant Fails to reject H_0	Not-Significant Fails to reject H_0	Not-Significant Fails to reject H_0	Not-Significant Fails to reject H_0

a. Kruskal Wallis Test b. Grouping Variable: TOB

Source: Compiled and calculated from primary data

The table above shows that the calculated Chi-square value is compared with its table value at a degree of freedom 2 and its significance value @ 5% level of significance. It shows either acceptance of H_a or failure to reject H_0.

H_0: There is no significant difference in gratification related to Excitement Requirements of mobile banking users of SBI, HDFC and Citi Bank.

Table 9. Kruskal-Wallis 1-Way ANNOVA mean rank related to Excitement Requirements (ER)

	Ranks			Results/ Ranks
	TOB	**N**	**Mean Rank**	
ER1	SBI	300	470.25	1st
	HDFC	300	412.33	3rd
	Citi Bank	300	468.92	2nd
	Total	900		SBI bank dominates.
ER2	SBI	300	432.20	3rd
	HDFC	300	479.32	1st
	Citi Bank	300	439.98	2nd
	Total	900		HDFC bank dominates.

Source: Compiled and calculated from primary data

Table 10. Calculation of Chi-Square Value - to measure statistical significance difference in Gratification Related to Excitement Requirements (ER)

Test Statistics a,b		
	ER1	**ER2**
Chi-Square	10.485	6.220
Df	2	2
Table Value	5.99	5.99
Asymp. Sig.	.005	.045
Results	$P(X^2(10.485) > 5.99) = .005 < 0.05$	$P(X^2(6.220) < 5.99) = .045 > 0.05$
Sig.\Insig.	Significant H_a Accepted	Significant H_a Accepted

a. Kruskal Wallis Test b. Grouping Variable: TOB

Source: Compiled and calculated from primary data

The table above shows that the calculated Chi-square value is compared with its table value at a degree of freedom 2 and its significance value @ 5% level of significance. It shows the acceptance of H_a.

H_0: There is no significant difference in gratification related to Neutral Attributes of mobile banking users of SBI, HDFC and Citi Bank.

Table 11. Kruskal-Wallis 1-Way ANNOVA Mean Rank Related to Neutral Attributes (NA)

	Ranks			Results/ Ranks
	TOB	**N**	**Mean Rank**	
NA1	SBI	300	468.34	2nd
	HDFC	300	478.85	1st
	Citi Bank	300	404.31	3rd
	Total	900		HDFC bank dominates.
NA2	SBI	300	473.36	1st
	HDFC	300	419.68	3rd
	Citi Bank	300	458.46	2nd
	Total	900		SBI bank dominates.

Source: Compiled and calculated from primary data

Table 12. Calculation of Chi-Square Value - to measure statistical significance difference in Gratification Related to Neutral Attributes (NA)

Test Statistics a,b		
	NA1	**NA2**
Chi-Square	15.486	7.470
Df	2	2
Table Value	5.99	5.99
Asymp. Sig.	.000	.024
Results	$P(X^2(15.486) > 5.99) = .000 < 0.05$	$P(X^2(7.470) > 5.99) = .024 < 0.05$
Sig.\Insig.	Significant H_a Accepted	Significant H_a Accepted

a. Kruskal Wallis Test b. Grouping Variable: TOB

Source: Compiled and calculated from primary data

The table above shows that the calculated Chi-square value is compared with its table value at a degree of freedom 2 and its significance value @ 5% level of significance. It shows the acceptance of H_a.

H_0: There is no significant difference in gratification related to Reverse Attributes of mobile banking users of SBI, HDFC and Citi Bank.

Table 13. Kruskal-Wallis 1-Way ANNOVA mean rank related to Reverse Attributes (RA)

Ranks				Results/ Ranks
	TOB	**N**	**Mean Rank**	
RA1	SBI	300	458.65	1st
	HDFC	300	442.20	3rd
	Citi Bank	300	450.65	2nd
	Total	900	SBI bank dominates.	
RA2	SBI	300	460.16	1st
	HDFC	300	451.30	2nd
	Citi Bank	300	440.05	3rd
	Total	900	SBI bank dominates.	

Source: Compiled and calculated from primary data

Table 14. Calculation of Chi-Square Value - to measure statistical significance difference in Gratification Related to Reverse Attributes (RA)

Test Statistics a,b		
	RA1	**RA2**
Chi-Square	.500	.974
Df	2	2
Table Value	5.99	5.99
Asymp. Sig.	.779	.614
Results	$P(X^2(0.500) > 5.99) = .779 < 0.05$	$P(X^2(0.974) > 5.99) = .614 < 0.05$
Sig.\Insig.	Not-Significant Fails to reject H_0	Not-Significant Fails to reject H_0

a. Kruskal Wallis Test b. Grouping Variable: TOB

Source: Compiled and calculated from primary data

The table above shows that the calculated Chi-square value is compared with its table value at a degree of freedom 2 and its significance value @ 5% level of significance. It shows the failure to reject H_0.

H_0: There is no significant difference between demographic profile (gender, age, marital status, educational qualification, occupation and income level) and gratification (BPENR) of mobile banking users of SBI, HDFC and Citi Bank.

Table 15. Calculation of Chi-Square Value - To Measure Statistical Significance Difference between Demographic Profile and Gratification Related to BPENR

Test statistics					
	Gender	**Age**	**Education**	**Occupation**	**Monthly Income**
Chi-Square	100.000a	42.942b	84.300c	21.280d	21.520b
Df	1	3	4	3	3
Table Value	3.84	7.82	9.49	7.82	7.82
Asymp. Sig.	.000	.000	.000	.000	.000
Results	$P(X^2(100.00) > 3.84) = .000 < 0.05$	$P(X^2(42.942) > 7.82) = .000 < 0.05$	$P(X^2(84.300) > 9.49) = .000 < 0.05$	$P(X^2(21.280) > 7.82) = .000 < 0.05$	$P(X^2(21.520) > 7.82) = .000 < 0.05$
Sig.\Insig.	**Significant; H_a Accepted**	**Significant; H_a Accepted**	**Significant; H_a Accepted**	**Significant; H_a Accepted**	**Significant; H_a Accepted**

Source: Compiled and calculated from primary data

The table above shows that the calculated Chi-square value is compared with its table value at a different degree of freedom and its significance value @ 5% level of significance. It shows the acceptance of H_a.

H_0: There is no significant difference in prior experience of M-banking use.

Table 16. Calculation of Chi-Square Value - to measure statistical significance difference in prior experience of using M-banking Services

Test Statistics	
	Prior Experience
Chi-Square	34.418a
Df	1
Table Value	3.84
Asymp. Sig.	.000
Results	$P(X^2(34.418) > 3.84) = .000 < 0.05$
Sig.\Insig.	Significant; H_a Accepted

Source: Compiled and calculated from primary data

The table above shows that the calculated Chi-square value is compared with its table value at a degree of freedom 1 and its significance value @ 5% level of significance. It shows the acceptance of H_a.

H_0: There is no significant difference in frequency of using M-banking services.

Table 17. Calculation of Chi-Square value - to measure statistical significance difference in frequency of using M-banking Services

Test Statistics	
Chi-Square	302.956a
Df	4
Table Value	9.49
Asymp. Sig.	.000
Results	P(X2(302.956) > 9.49) = .000 < 0.05
Sig.\Insig.	Significant; Ha Accepted

Source: Compiled and calculated from primary data

The table above shows that the calculated Chi-square value is compared with its table value at a degree of freedom 4 and its significance value @ 5% level of significance. It shows the acceptance of H_a.

Based On Quantitative Hypotheses

H_0: There is no significant difference in volume (i.e. number) of m-banking transactions of SBI, HDFC and Citi Bank aftermath COVID-19. (H_0:$\mu vol_{SBI} = \mu vol_{HDFC} = \mu vol_{,Citi\ Bank}$)

Table 18. Descriptive Statistics: Related to Volume of M-banking Transactions

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
VOLPRESBI	5	300516767	337113205	322469099	14716214.15
VOLPOSTSBI	5	287963313	424607423	370776973	55013702.67
VOLPREHDFC	5	108376705	129307244	121382721	8062225.05
VOLPOSTHDFC	5	86337417	150214245	119898353	24522352.72
VOLPRE'CITI BANK	5	1835063	1973294.00	1903472	53708.78
VOLPOST'CITI BANK	5	1460133	1681857.00	1558342	96246.13
Zscore (VOLPRESBI)	5	-1.49171	.99510	.0000000	1.00000000
Zscore (VOLPOSTSBI)	5	-1.50533	.97849	.0000000	1.00000000
Zscore(VOLPREHDFC)	5	-1.61320	.98292	.0000000	1.00000000
Zscore (VOLPOSTHDFC)	5	-1.36859	1.23626	.0000000	1.00000000
Zscore (VOLPRE'CITI BANK)	5	-1.27371	1.30000	.0000000	1.00000000
Zscore (VOLPOST'CITI BANK)	5	-1.02040	1.28332	.0000000	1.00000000
Valid N (listwise)	5				

Source: Compiled and calculated from primary data

From the calculated Minimum, Maximum, Mean and Standard Deviation value (in table 19), the researcher has found Z-Score using Z-table negative and positive value for sample SBI bank as follow:

Calculation Z-Score and Pre-Post Per cent changes in Volume of M-banking Transactions SBI

Pre:		**Minimum**				**Maximum**		
	Z1 =	300516767	–	322469099	Z2=	337113205	–	322469099
		14716214.15				14716214.15		
	Z1=	-1.49			Z2=	0.99		
	Z1=	-0.0681			Z2=	0.8389		
Pre - Per cent (SBI) = (Z2-Z1) = (0.8389-0.0681) = 0.7708 = **77.08%**								
		Minimum				**Maximum**		
Post:	Z1 =	287963313	–	370776973	Z2=	424607423	–	370776973
		55013702.67				55013702.67		
	Z1=	-1.5			Z2=	0.97		
	Z1=	-0.0648			Z2=	0.834		
Post - Per cent (SBI) = (Z2-Z1) = (0.8340-0.0648) = 0.7692 = **76.92%**								

Calculation Z-Score and Pre-Post Per cent changes in Volume of M-banking Transactions HDFC

Pre:		**Minimum**				**Maximum**		
	Z1 =	108376705	–	121382721	Z2=	129307244	–	121382721
		8062225.05				8062225.05		
	Z1=	-1.61			Z2=	0.98		
	Z1=	-0.0537			Z2=	0.8365		

Pre - Per cent = (Z2-Z1) = (0.8365 - 0.0537) = 0.7828 = **78.28%**								
		Maximum				**Maximum**		
Post:	Z1 =	86337417	–	119898353	Z2=	150214245	–	119898353
		24522352.72				24522352.72		
	Z1=	-1.368			Z2=	1.2362		
	Z1=	-0.08534			Z2=	0.8925		
Post - Per cent (SBI) = (Z2-Z1) = (0.8925 - 1.368) = 0.80716 = **80.72%**								

Calculation Z-Score and Pre-Post Per cent changes in Volume 0f M-banking Transactions CITI BANK								
Pre:		**Minimum**				**Maximum**		
	Z1 =	1835063	–	1903472	Z2=	1973294	–	1903472
		53708.78				53708.78		
	Z1=	-1.273			Z2=	1.3		
	Z1=	-0.10027			Z2=	0.9302		
Pre - Per cent = (Z2-Z1) = (0.9302 - 1.273) = 0.82993 = **82.99%**								
		Minimum				**Maximum**		
Post:	Z1 =	1460133	–	1558342	Z2=	1681857	–	1558342
		96246.13				96246.13		
	Z1=	-1.02			Z2=	1.2833		
	Z1=	-0.15386			Z2=	0.8997		
Post - Per cent (SBI) = (Z2-Z1) = (0.8997 - 0.15386) = 0.74584 = **74.58%**								

Source: Compiled and calculated from primary data

Table 19. Z-Score: Aftermath COVID-19 Related to Volume of M-banking

Name of The Bank (Volume of M-banking)	**Pre -Percent**	**Post Percent**	**Difference (% Increase\% Decrease)**
SBI	77.08 %	76.92 %	00.16 % (Decrease)
HDFC	78.28 %	80.72 %	02.44 % (Increase)
Citi Bank	82.99 %	74.58 %	08.41 % (Decrease)

Source: Compiled and calculated from primary data

Hence, the Alternate Hypothesis, there is a significant difference in volume (i.e. number) of m-banking transactions of SBI, HDFC and Citi Bank aftermath COVID-19. (H_0:$\mu vol_{SBI} = \mu vol_{HDFC} = \mu vol_{\cdot Citi\ Bank}$), is accepted.

H_0: There is no significant difference in value (i.e. amount) of m-banking use of SBI, HDFC and Citi Bank aftermath COVID-19 (H_0: $\mu val_{SBI} = \mu val_{HDFC} = \mu val_{\cdot Citi\ Bank}$)

Table 20. Descriptive statistics related to value of M-banking transactions

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
VALPRESBI	5	910042961	1054325130.37	981478286.54	59670139.53
VALPOSTSBI	5	925024539.83	1373117981.00	1229123774.56	185372952.98
VALPREHDFC	5	660154034.10	726268897.70	699673177.02	25745493.54
VALPOSTHDFC	5	427146398.30	826220988.90	673413205.10	162568589.94
VALPRE'CITI BANK	5	37749396.82	43713103.50	41109833.76	2515407.30
VALPOST'CITI BANK	5	29215948.74	38735733.45	34128391.652	3886039.31
Zscore (VALPRESBI)	5	-1.19717	1.22083	.0000000	1.00000000
Zscore (VALPOSTSBI)	5	-1.64047	.77678	.0000000	1.00000000
Zscore (VALPREHDFC)	5	-1.53499	1.03302	.0000000	1.00000000
Zscore (VALPOSTHDFC)	5	-1.51485	.93996	.0000000	1.00000000
Zscore (VALPRE'CITI BANK)	5	-1.33594	1.03493	.0000000	1.00000000
Zscore (VALPOST'CITI BANK)	5	-1.26413	1.18561	.0000000	1.00000000
Valid N (listwise)	5				

Source: Compiled and calculated from primary data

From the calculated minimum, maximum, mean and standard deviation value (in table 19), the researcher has found Z-Score using Z-table negative and positive value for sample SBI bank as follow:

The Calculation of Aftermath COVID-19 of Value of M-banking of SBI bank

Calculation Z-Score and Pre-Post Per cent changes in value of M-banking Transactions								
SBI:								
Pre:		**Minimum**				**Maximum**		
	Z1 =	910042961	–	981478286.5	Z2=	1054325130	–	981478286.5
		59670139.53				59670139.53		
	Z1=	-1.2			Z2=	1.22		
	Z1=	-0.11507			Z2=	0.88877		
	Pre - Per cent (SBI) = (Z2-Z1) = (0.88877-0.11507) = .7737 = 77.37 %							
		Minimum				**Maximum**		
Post:	Z1 =	925024539.8	–	1229123775	Z2=	1373117981	–	1229123775
		185372953				185372953		
	Z1=	-1.64			Z2=	0.78		
	Z1=	-0.0505			Z2=	0.7823		
	Post - Per cent (SBI) = (Z2-Z1) = (0.78230-0.05050) = 0.7318 = 73.18 %							
Calculation Z-Score and Pre-Post Per cent changes in value of M-banking Transactions								
HDFC:								
Pre:		**Minimum**				**Maximum**		
	Z1 =	660154034.1	–	699673177	Z2=	726268897.7	–	699673177
		25745493.54				25745493.54		
	Z1=	-1.53			Z2=	1.03		
	Z1=	-0.06301			Z2=	0.84849		
	Pre - Per cent = (Z2-Z1) = (0.84849 - 0.06301) = 0.7883 = 78.83 %							
		Maximum				**Maximum**		
Post:	Z1 =	427146398.3	–	673413205.1	Z2=	826220988.9	–	673413205.1
		162568589.9				162568589.9		
	Z1=	-1.51			Z2=	0.94		
	Z1=	-0.06552			Z2=	0.82639		
	Post - Per cent (SBI) = (Z2-Z1) = (0.82639 - 0.06552) = 0.7609 = 76.09%							
Calculation Z-Score and Pre-Post Per cent changes in value of M-banking transactions								
Citi Bank:								
Pre:		**Minimum**				**Maximum**		
	Z1 =	37749396.82	–	41109833.76	Z2=	43713103.5	–	41109833.76
		2515407.3				2515407.3		
	Z1=	-1.34			Z2=	1.03		
	Z1=	-0.09012			Z2=	0.84849		
	Pre - Per cent = (Z2-Z1) = (0.84849 - 0.09012) = 0.7584 = 75.84 %							
		Minimum				**Maximum**		
Post:	Z1 =	29215948.74	–	34128391.65	Z2=	38735733.45	–	34128391.65
		3886039.31				3886039.31		
	Z1=	-1.26			Z2=	1.19		
	Z1=	-0.10383			Z2=	0.88298		
	Post - Per cent (SBI) = (Z2-Z1) = (0.88298 - 0.10383) = 0.7792 = 77.92 %							

Source: Compiled and calculated from primary data

Table 21. Z-Score: Aftermath COVID-19 Related to Value of M-banking

Name of The Bank (Volume of M-banking)	Pre-Percent	Post Percent	Difference (% Increase\% Decrease)
SBI	77.37 %	73.18 %	04.19 % (Decrease)
HDFC	78.83 %	76.09%	02.74 % (Decrease)
Citi Bank	75.84 %	77.92 %	02.08 % (Increase)

Source: Compiled and calculated from primary data

Hence, the alternate hypothesis, there is no significant difference in value (i.e. amount) of m-banking use of SBI, HDFC and Citi Bank aftermath COVID-19 (H_0: μval SBI = μval HDFC = μval' Citi Bank), Thus this hypothesis is accepted.

H_0: There is no association between volume and value of M-banking transactions of SBI, HDFC and Citi Bank.

To test above hypothesis, the researcher has collected secondary data related to volume and value of m-banking transactions of SBI, HDFC and Citi Bank from November, 2019 to August, 2020.

Table 22. Correlations Statistics: Volume and Value of M-banking transactions

Correlations			
		VOL	VAL
VOL	Pearson Correlation	1	.951**
	Sig. (2-tailed)		.000
	N	30	30
VAL	Pearson Correlation	.951**	1
	Sig. (2-tailed)	.000	
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Compiled and calculated from primary data

In the table above, a Pearson's Data Analysis shows a Very High Positive Correlation, r (30) = 0.951, which clearly states that the increase in number of m-banking transactions results into increase in values of transactions of SBI, HDFC, Citi Bank m-banking transactions.

Table 23. Model Summary: Volume and Value of M-banking Transactions

Model Summary [b]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df 1	df 2	Sig. F Change	
1	.951[a]	.905	.902	145067623 .48663	.905	266.770	1	28	.000	.408

a. Predictors: (Constant), VOL b. Dependent Variable: VAL

Source: Compiled and calculated from primary data

The above Model states that 95.10 (0.951*100) per cent of the Dependent Variable i.e. value of m-banking transactions of SBI, HDFC and Citi Bank by the independent variable i.e. volume of m-banking transactions of SBI, HDFC and Citi Bank. Calculated value of Durbin-Watson is 0.408 (it is between 0 and less than 2) indicates Positive Autocorrelation between value of and volume of m-banking transactions of SBI, HDFC and Citi Bank.

Table 24. One-Way ANOVA: Volume and Value of M-banking Transactions

ANOVA [a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5614080707056142300.000	1	5614080707056142300.000	266.770	.000[b]
	Residual	589249230753630590.000	28	21044615384058228.000		
	Total	6203329937809772500.000	29			

a. Dependent Variable: VAL b. Predictors: (Constant), VOL

Source: Compiled and calculated from primary data

The Calculated Fisher Value Fcrit (1, 28) = 266.770 is greater than its critical value 4.20 (at df1 1 and df 2 28) and its Significance Value is 0.000 (i.e. p = 0.000), which is less than 0.05, and therefore there is an association between value and volume of m-banking transactions of SBI, HDFC and Citi Bank.

Table 25. Number of Credit Cards and Point-of-Sale Transactions

Coefficient s[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	145109729.501	38871708.825		3.733	.001
	VOL	2.973	.182	.951	16.333	.000

a. Dependent Variable: VAL

Source: Compiled and calculated from primary data

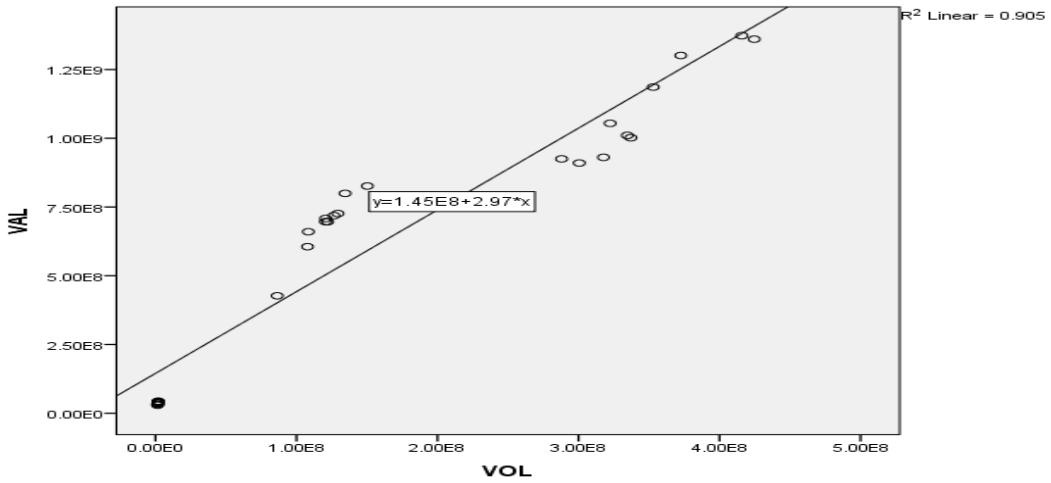

Figure 2. Graphical Presentation of Regression Equation

From the table above and a graph; following regression equation has been formed.

Y_i = Assumed to be volume of m-banking transactions of SBI, HDFC Citi Bank.
b_0 = Constant Value from Table
b_i = Dependent Variable - Value of m-banking
Xi = Assumed to be Independent Variable - Volume of m-banking
Y_i = $b_0 + b_i (X_i)$
Yi = 145109729.501 + 2.973 (Xi)..... ……(1)

The above regression coefficient shows that for every unit of increase in volume of m-banking use of each sample bank, it is expected that the value of m-banking of sample bank transactions increase by 2.973 in a month. Further, to check the fitness of the above regression model, the researcher has found the unstandardized predicted volume and value of m-banking transactions, as follow;

Table 26. Correlations Statistics: Unstandardized predicted value volume and value of M-banking transactions

Correlations

		VAL	Unstandardized Predicted Value
VAL	Pearson Correlation	1	.951**
	Sig. (2-tailed)		.000
	N	30	30
Unstandardized Predicted Value	Pearson Correlation	.951**	1
	Sig. (2-tailed)	.000	
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Compiled and calculated from primary data

The table above prove the fitness of above regression model, with respect to R^2 Linear = 1 = 1 (in graph).

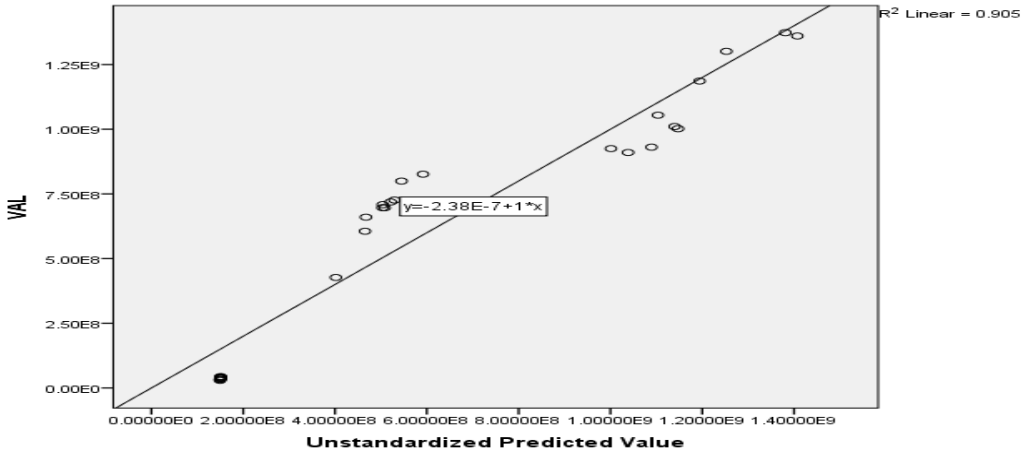

Figure 3. Graphical Presentation of Regression Equation Based on Unstandardized Predicted Value

Therefore, the alternate hypothesis, "There is an association between volume and value of M-banking transactions of SBI, HDFC and Citi Bank.", is accepted. (H_0: μSBI ≠ μHDFC ≠ μ'CITI BANK).

DISCUSSIONS

The findings of the study on the research 'Mobile Banking: An Analytical Study on Aftermath COVID-19 and Gratification from the Aspect of KANO Model' are as follows:

- Overall female M-banking users found to be more aware and benefited: Female M-banking users were more (66.67%) as compared to male (33.33%) in SBI, HDFC and Citi Bank. However, there is negligible difference in number of female M-banking users in SBI (N=202) and HDFC (N=203) and male M-banking users in SBI (N=98) and HDFC (N=97).
- Most of the m-banking users belong to the age group of up to 25 years. This is because they found ease and prefer flexibility in carrying out banking transactions.
- The data reveals that around 27.11% government employees are using M-banking from SBI, HDFC and Citi Bank. However, there is negligible difference between government employee and business doing M-banking users.
- It is also found that, majority 29.33% M-banking users belong to the income group up to Rs. 24999. This shows M-banking users with higher income (Rs. 75000 and above) is comparatively less because of hacking and security concern.
- Most of the M-banking users have prior experience of M-banking services. It is found that there is a significant difference in prior experience of using M-banking services.
- Daily use of M-banking services enjoyed by 31.22% customers. The consistency in Providing M-Banking Services shows that HDFC M-banking users were more satisfied than SBI and Citi Bank. The bank has good reputation and provides reliable method of M-Banking shows that SBI M-banking users more satisfied than HDFC and Citi Bank.
- The M-Banking Services are totally secured reveals that HDFC M-banking user are more satisfied than SBI and Citi Bank. The easy portability of M-Banking Services reflected that, Citi Bank M-banking users more satisfied than HDFC and SBI. The support to customers shows that, HDFC M-banking users more satisfied than SBI and Citi Bank.
- The comprehensive services provided by banks i.e. M-Banking Services shows that SBI M-banking users more satisfied than HDFC and Citi Bank. M-Banking provides flexibility in acceptance of different plastic cards\Payments, shows that HDFC M-banking users are more satisfied than SBI and Citi Bank.
- The interface of M-Banks Services were users friendly, shows that HDFC M-banking users are more satisfied than SBI and Citi Bank. M-Banking services highly secured, shows that SBI M-banking user more satisfied than HDFC and Citi Bank. It is found that there is decrease in volume of M-banking transactions of SBI (00.16% decrease) and Citi Bank (05.54% decrease). However, there is 01.94% increase in M-banking transactions of HDFC bank. It is found that there is decrease in value of M-banking transactions of SBI (04.29% decrease) and HDFC (02.72% decrease). However, there is 02.21% increase in M-banking transactions of Citi Bank.

CONCLUSIONS

From the present research study, it has been observed that the M-banking is a financial service providing online and over internet mobile based platform, found to be immediate substitute to plastic money, which helps to reduce the risk of carrying cash and boost up money in digital form for bank customers' convenience and safety.

- Telecommunication and cellular service provider should extend their network coverage to remote rural area (Time call in COVID-19). This promotes the banks to provide services to areas were physical branch access not possible. Hence, bank can expand their banking services in rural area with m-banking coverage, it should be made users friendly and with regional language option.
- For every wrong data input for online transactions, reversal procedure should be made immediate. Bank should expand their merchant tie-up for payments and associations. Bank should make synchronization ease with different m-wallets platforms. This helps to push an economy towards digital banking.
- There should be professionals and technicians at bank branch to educate users about its usage. Bank should allow use of m-banking for non-core banking purpose also.
- Mobile platform should be well networked with bank server, to avail easy and error free access to account.
- The bank should monitor transactions to implement Artificial Intelligence (AI). Security concern and anti-hacking measures must be undertaken by banks to promote On-line Transactions using m-banking.
- The bank should direct their branches in rural and urban areas to have some definite number of mobile banking accounts.

Mobile banking has transmogrified the banking from brick-mortar to virtual banking-online, using smartphones called as M-banking. M-banking provides flexibility, convenience, safety and security to bank customers and further offer them account related utility services. M-banking provides bank based mobile application to carry out financial transactions. There is a threat of hacking, cloning and safety-security concern also.

Hence, m-banking users should be made aware on time about its secured use and passcode change and re-change. Technological advancement and banking policy amendments has made it financial inclusive. This is the time to understand and resolve with M-banking problems to make it more dependable and efficient.

Author Contributions: Conceptualization, V.G. and B.J.; Methodology, B.J. and V.G.; Software, B.J. and K.J.S.; Validation, V.G. and R.N.; Formal Analysis, V.G.; Investigation, R.N., K.J.S. and V.G.; Resources, V.G. and B.J.; Data Curation, K.J.S. and J.B.; Writing – Original Draft Preparation, V.G., B.J. and K.J.S.; Writing – Review & Editing, V.G., B.J. and K.J.S.; Visualization, J.B. and B.J.; Supervision, R.N.; Project Administration, V.G.; Funding Acquisition, K.J.S. and R.B.N. Authors have read and agreed to the published version of the manuscript.
Institutional Review Board Statement: Ethical review and approval were waived for this study because the research does not deal with vulnerable groups or sensitive issues.
Funding: The authors received no direct funding for this research.
Acknowledgments: Not applicable.
Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.
Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to restrictions.
Conflicts of Interest: The authors declare no conflict of interest.

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