

Statistical Analysis of Effect on Before and After Digitalisation, Benefits and Challenges Faced – A study

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Abstract

Purpose: The stellar purpose of the present study is to know how far the moderator variables impact the study on digitalisation in banking industry. Further, the study also intended to know the before and after digitalisation effect, the challenges faced and benefits of digitalisation in the banking industry in Bengaluru. The traditional relationship between bank and its customer is one-to-one (Bhagyashree, 2018) but the modern outlook of banks with customers is one-to-many. The digital product helps the banks to provide their performance and also helps to widen market and improve financial position and performance.

Approach: A structured closed ended questionnaire was administered as schedule in order to avoid delay, incompleteness and rejection. Respondents were approached for the purpose of data collection by meeting the respondents in the banks premises. The respondents were interviewed in a natural setting and requested to provide data. χ^2 , Kendall's coefficient of concordance, weighted arithmetic mean and Garrett Ranking technique was performed.

Findings: The study found the presence of significant variation in the data and with high degree of relationship. Kendall's coefficient of concordance reveals that after digitalisation the respondents getting more benefits. Further, the benefits emerged from the research includes creates more convenience to the customers, the second rank was awarded to creates prerequisite and favourable conditions for successful development of virtual enterprises and third rank was given to two equal variables rural and urban gap is eliminated and number of customers will be amplified. The challenges include cybercrime, increasing competition and creating valuable content.

Keywords: Cyber crimes, service, customer amplification, value content, competitors, transparency, eco-friendly, gap, technology, literacy.

Introduction:

The term digitalisation refers to and include the complete spectrum of the advantages in the banking sector (Shetty et al. 2019). It is the process of converting information into digital format through technology. In the simplest form the digitalisation of banking business mean

that the traditional services offered by banks are now offered through digital means (Kaur Buljinder et al. 2021). Under digitalisation all manual process has been replaced by digital service. In 1996 the ICICI bank became the first bank in India to provide online banking service (ICICI Bank, 2018).

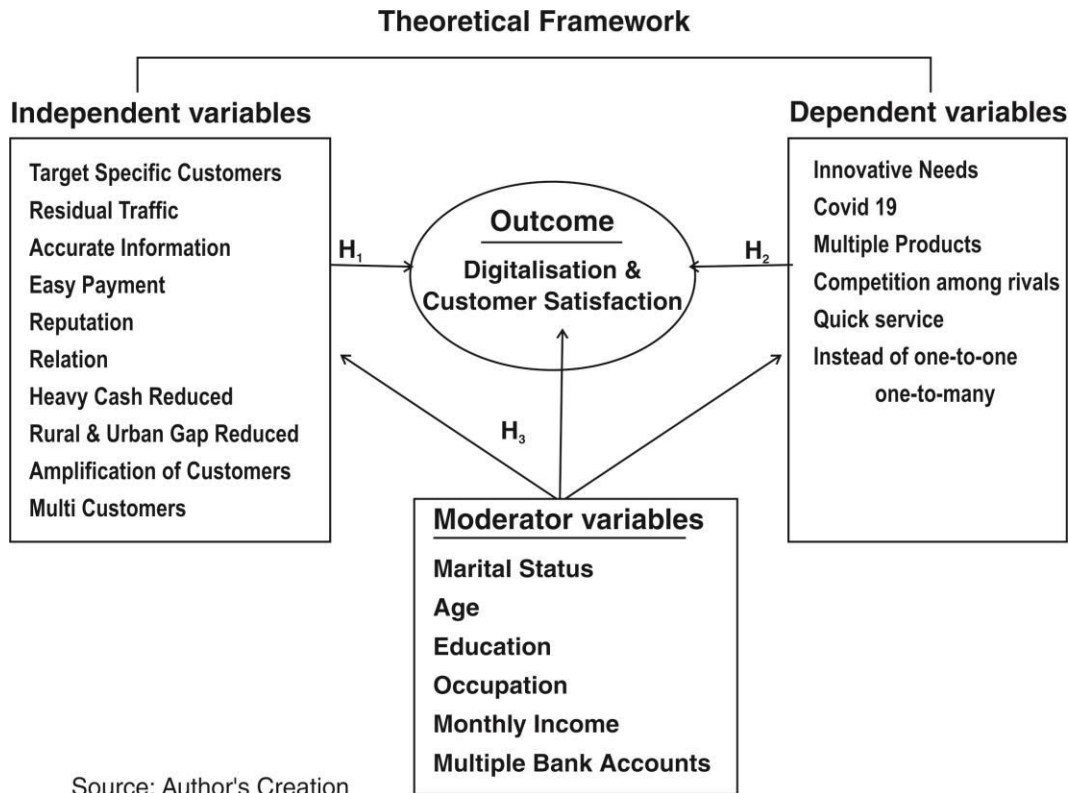
Digitalisation suffuse the modern world and banking industry is no different (Pooja Sharma et al. 2023). The digital technologies and Covid-19 pandemic have impacted industry very much. The digital transformation forcing changes in the very structure of banking industry's service. A move from traditional to modern 'system needs a focus on different level governance (Leal Filho et al. 2020; Awan et al. 2020). The banking industry needs to strengthen and ensure the availability of quality web oriented technological service in order to meet the needs of customers competitively (Zaidi & Rupeika Apoga, 2021). Banks across India are making heavy investment to maintain competitive edge and to satisfy innovative needs of modern days customer needs and to deliver speedy service. Digitalisation in banking industry saves customers and bankers time and a variety of services offered by the banks are helping them to attain revenue and stay in the market. On account of adverse effects of several financial reforms in India in the late 1980s, the banking industry saw a need to improve customer service and computerise the recording of transactions. All manual process has been replaced by digital service. The sustainability of banking sector rests on customer satisfaction and statistical customers becomes loyal customers.

Indian economy is all set to become 6th largest in the world says recent report by British consultancy cyber. It reveals that Indian economy will surpass Finance aid in 2023, Britain. The trend of toppling of Economies of the world is a massive game changer. India surpassed every nation including China and US in digital financial transaction. The emergence of ATMs and credit cards paved the way for the digitalisation of the banks (Mohana Sujana, S. V. 2018). Digitalisation enhances efficiency and enables smoother transactions. It offers better service efficiency with less human error (Raghavendra Nayak, 2018).

Statement of the problem:

The growing awareness of knowledge customers and their innovative needs has to be addressed by the commercial banks in order to be more competitive and stay in the market to gain revenue. In 1998 the ICICI bank introduced online banking services from that day onwards banks are investing upon innovative technology to address the needs of customers. In order to be more competitive and to render valuable services the banking industry discarded the traditional pattern and new type of methodologies like digitalisation has already introduced by banks. The Covid-19 pandemic also forced to insist on online banking and afterwards several commercial banks have started to introduce innovative digital products and these are introduced by the banks in order to be more competitive and to face rival strategies. The governments programmes like "Digital India", "Make in India" and "skill India" creates more opportunities to one and all and thus they are popular in becoming inclusive programme and hence and opting of digital technology is found more. Digitalisation is beneficial to people in remote locations to access banking success. Through digital banking individuals can easily make transactions, check their account and even make transfer with a single click of a button on their smart phone, desk top or any other digital derive. Digital

services addressed the problems of customers. It saves cost and valuable time and dynamic decisions can be taken through digitalisation. Digitalisation treats every customer similar and human errors are reduced.



Review of literature:

Sharma and Bhalla (2018) in their attempt to study about Indian people’s comfort levels with online transactions reveal that the Indian citizen coordinated with government decisions towards digitalisation. Further, the researchers have stated that the Indian government give their best to widen cashless transactions in the economy.

Shetty et al. (2019) studied the digitalisation in banks and consequent develop of Indian economy through concentrating on the problems and prospects. The study found the digitalisation helped improve customer services cost and time of banks and customers, assisted in facing severe competition and earning extra income from promotional activities. Further, the researchers stated that banks face the challenge of cybercrime, selection of ATM locations and right technology.

Shifa Fathima (2020) explained why banks in India adopt digitalisation. The researcher concluded that the transformation to computerisation and its consistency should help the company save money by reducing labour and automating the system. Further, the researcher

stated that in the digitalisation era the main task is to ensure that all customers are secured from cybercrime and the best technical mechanism is used.

Kaur et al. (2021) attempted to study the impact of digitalisation on customer's satisfaction. The researcher used SRVQUAL model to conduct the study. The findings of the study reveal that Northern Indian customers of digital banking were delighted with the service given by the digitalisation of banks.

Pooja Sharma et al. (2023) in their research work they have explained that how service marketing is positively related to digitalisation. They have stated that better the service marketing of banks the better success the bank attains in turn satisfying its customers. Satisfied customers in turn promote customer loyalty. The variable like tangibility, system availability and others have 9 direct impact on customer satisfaction.

Objectives of the study:

1. To study the socio economic characteristics of respondents.
2. To study respondents views marketing before and after digitalisation.
3. To analyse the benefits of digital marketing in banking sector.
4. To study the challenges of digitalisation in banking sector.

Hypotheses:

1. There exists no significant variation in the socio economic characteristics.
2. There is no significant variation in the before and after digital marketing in banking sector.
3. There exists no significant variation in the benefits of digitalisation.
4. There are no challenges of digitalisation in banking sector.

Research questions:

1. What are the reasons behind the socio economic characteristics not impacting on the study?
2. What are the respondent views in digitalisation before and after digitalisation?
3. What are the benefits of digital marketing?
4. What are the challenges of digitalisation in banking sector?

Research Methodology:

Research methodology is a strategy for answering the structured questionnaire using empirical data. It should be an academic procedure (Claire Sellitz, 2018). Research is an academic activity and as such the term should be used in a technical sense (Kothani, C. R., 2013). Zikmund (2003) stated that research plan as a master design through which techniques are performed for the purpose of data collection and analysis of data.

Sekaram and Bougie (2010) are that vigour of a methodology enhances when researchers moves through of testing from an exploratory research. Cavana et al. (2001) expressed that research could be within natural context i.e., in a non contrived setting. The present study considered to collect the required data by interviewing bank customers. This type of are labelled as cross sectional i.e., consulting a typical or representative sample group (Cavana et al., 2001).

Questionnaire design: Questionnaires contains a set of pre determined and tested questionnaire. The data collected in a natural setting while the respondents approached the banks. The researcher himself collected the data by visiting banks with prior request after explaining the intention of research.

Universe of the study: The study is confined to Bengaluru Urban District and from each taluk 20 respondents were met and interviewed. The taluks include Bengaluru South, East, North, Anekal & Yelahanka

Participants: The customers of different private and public banks of Bengaluru Urban district were selected and banks state Bank of India, Canara Bank, HDFC banks different branches were conveniently selected and 100 respondents interviewed.

Sample and Sampling technique: Convenient sampling technique was followed was performed to collect the required data. A sample of 100 was though fit for the present study. A total of 110 questionnaires were in the hand and out of this 100 were useable are forming this 90.90% success rate.

Method of analysis: The present performed χ^2 , contingency coefficient, Kendall's coefficient of concordance and weighted arithmetic mean and Garrett Ranking Technique (w).

Variables of the study: The socio economic characteristic forms moderator variables. The dependent variable is digital services to the respondents and independent variables include targeting customers, accurate information, electronic payments, services, reputation, strong relationship, amplification of customers, rural and urban group, fake currency threat, customers segmentation convenience to the customers etc.,

Primary and secondary data source: The primary data was collected by performing questionnaire and the secondary sources include journals, and websites.

Limitations :

1. The study is confined only to Bengaulru Urban district.
2. The data was collected in a limited time.
3. A limited sample from the universe is only considered.
4. Any generalisation requires further depth study.

Data presentation and analysis of Data – A

The required socio economic characteristics of respondents like gender marital status, age, education, occupation, monthly income, living area etc., are considered. These characteristics were studied to know how far they impress on the study.

Research question No. 1: What are reasons behind the socio economic characteristics not impacting on the study?

Hypotheses No. 1: **H₀:** There is no significant variations in the socio economic characteristics and hence they do not impact on the study.

H₁: There exist significant variation in the socio economic characteristics of respondents and hence they impact on the study.

Table-1 reveals data about socio economic characteristics of respondent. There are 81 respondents males and out of 100 respondents 85 are married. The age data reveals that 38 belong to 31-35 years, 20 to the 26-30 years, 12 each to the 21-25 years and 36-40 years. 51 are general degree holders, 18 PG degree holders, 16 professional, 10 PUC and 5, 10th standard. 41 respondents are working in private sector 12 doing business, 10 in government service, 9 retired 8 agriculture and 7 home makers. The monthly income data reveals that 45 were getting monthly income in the range of Rs. 31K – 40K, 21K in between 41K-50K, 12 getting in between 21K-30K, 9, 50K-60K, 8<20K and 5-60K. 61 are living developing areas, 21 in developed and 18 in outskirts and 80 are SB a/c. holders and 20 are current a/c. holders. All the socio economic characteristics reveal a significant variation in the data with high degree of relationship between socio economic characteristics and digitalisation.

Data Analysis and presentation – B

Research question No.2: What are the respondents views on digitalisation before and after digitalisation?

Hypotheses No. 2 : **H₀:** There is no significant variation in the respondents before and after digitalisation.

H₁: There exist significant variation in the data and there is difference of opinion between before and after digitalisation.

Table – 2 & 3 highlights data on respondents views on marketing before and after digitalisation. Before digitalisation there were 70 respondents who expressed strongly agree followed by 18 agree and 12 somewhat agree and after digitalisation there were 80 respondents who stated strong agree, followed by 12 agree and 8 somewhat agree. The ‘w’ value before 0.27 and after digitalisation it was 1.1497. The difference between before and after is 0.8797. The significance of ‘w’ by using the chi-square statistic and it reveals about the high degree of relationship between the opinions expressed by respondents and digitalisation.

Research question No. 3 : What are the benefits of digital marketing?

Hypotheses : No. 3 : H_0 : There is no significant variation in the data on benefits of digitalisation.

H_1 : There exist significant variation in the benefits of digitalisation.

Tables – 4 highlights data on benefits of digital marketing in banking sector. To measure the benefits of digital marketing in banking sector weighted arithmetic mean. 5 point Likert scale was performed varying from “Strongly agree to strongly disagree”. Weights (w) were given to the Likert scale starting from 5, 4, 3, 2 & 1 respectively. The opinions of respondents is defined as “f” and “fw” was obtained and finally total was obtained and this total was divided by the sum of $5+4+3+2+1 = 15$ to get WA. Ranking was done on the basis of strength of WA. Accordingly the first rank was assigned to create more convenience to the customers, the second was awarded to creates pre-requisites and favourable conditions for successful development of virtual enterprises and the third rank was given to two equal variables i.e., rural and urban gap is eliminated and number of customers will be completed.

Research question No. 4: What are the challenges of digitalisation in banking sector?

Hypotheses No. 4 : H_0 : There exist no significant variation in the challenges of digitalisation.

H_1 : There exist significant variation in the data.

Table – 5 highlights data on the challenges of digitalisation the banking sector. To measure challenges Garrett Ranking Technique was performed. By applying the formula $100(1-0.5)/N_j$ calculated value are obtained and these per cent values are further referred to Garrett Ranking convention table to get Garrett values. These Garrett values are multiplied with f i.e., the opinion of respondents. The total was divided by N to get “mean score” and ranking was awarded based on the strength of Mean score. Accordingly the first rank was awarded to cyber crime challenge, the second rank was given to increasing competition and the third rank was awarded to creating valuable content.

Summary of the study:

The study was conducted at Bengaluru Urban and banks like SBI, Canara Bank and ICICI both private and public banks were selected in the areas of commercial streets Rajajinagar and Malleshwaram. The study performed convenient sampling technique and data collated by administering a well drafted questionnaire after viewing the issues like delay, incompleteness and level of literacy rate. The study revealed about the presence of significant variation in the mediator variables and they reveal that exist high degree of relationship between the two variables. The study further reveals about before and after the digitalisation and it was found after digitalisation respondents found more useful. Further, the study found the benefits which are ranked as per the strength of “WA”. Accordingly the first rank was awarded to creates more convenience to the customers, the second rank was given to creates prerequisites and favourable conditions for successful development of virtual enterprises and third rank was awarded to two equal variables rural and urban gap is eliminated and number of

customers will be amplified. The challenges of digitalisation are ranked as per the strength of mean score and accordingly the first rank was awarded to cybercrime, the second rank was given to increasing competition and third was awarded to creating valuable content. The findings of the study in presented, analysed and discussions by using appropriate quantitative techniques like χ^2 , contingency co-efficient, Kendall's coefficient of concordance, weighted arithmetic mean and Garrett Ranking technique.

Conclusion:

Digitalisation is becoming universal popularity as it provides multi benefits. Way back in 1980 the Indian banking sector recognised the necessity for computerisation to improve the customer service, book keeping and record keeping. Several commercial banks began to shift toward digital service in order to stay more competitive and relevant in the race. At present in Bengaluru digitalisation has become a powerful tool providing continues service to the customers. People preferred digital banking over traditional banking. The study found significant variation in the moderator variables with high degree of relationship. The marketing views of respondents found more after digitalisation and digitalisation was useful on nine statements. Further, the benefits of digitalisation includes, creates more convenience to the customers, creates pre requisites and favourable conditions for successful development of virtual enterprises and two equal ranks like rural and urban gap is eliminated and number customers will be amplified. The challenges of digitalisation found as per the study includes as per Garrett ranking technique, cybercrime increasing competition, and creating valuable content.

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Table – 1 : Demographic profile of respondents

Demographic profile of respondents	χ^2	TV@0.05	df	result of χ^2	“c”	Result of ‘C’
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Gender	38.44	3.841	1	Significant	0.52	High Degree
Marital status	49.00	3.841	1	Significant	0.57	High Degree
Age (in years)	34.80	11.070	5	Significant	0.50	High Degree
Education	65.30	9.488	4	Significant	0.62	High Degree
Occupation	76.64	14.067	7	Significant	0.65	High Degree
Monthly income (INR)	66.79	11.070	5	Significant	0.63	High Degree
Living area	34.58	5.991	2	Significant	0.50	High Degree
Type of account	36.00	3.841	1	Significant	0.51	High Degree

Source : Field Survey

Note : $\chi^2 =$ chi-square

'c' = $\sqrt{(\chi^2 / \chi^2 + N)}$

Where 'c' = contingency coefficient

N = Number of observations

When the value 'c' is equal or near 1, it means there is high degree of association between attributes. Contingency co-efficient will always to be less than 1. High degree is considered here if 'c' is 0.50 and above.

Table – 2 : Respondents views on marketing before digitalisation

Factors driving views on marketing	SA	A	SWA	RT	RT ²
Targets specific customers	12	5	2	19	361
Accessible to any business	12	3	2	17	289
Creates residual traffic	8	2	1	11	121
System deals with customers	5	1	1	7	49
Accurate information is provided	6	1	1	8	64
Electronic payment is easy	8	1	2	11	121
Company provides services in different forms	5	1	1	7	49
Company enjoys great reputation	6	2	1	9	81
Company enjoys strong relationship with customer	8	2	1	11	121
Total	70	18	12	100	1256

Source : Field Survey

Note : SA - Strongly Agree, A - Agree, SWA - Somewhat Agree, RT - Row Total

$$SSR = \sum RT^2 - (\sum RT)^2 / N$$

$$= 1256 - (100)^2 / 10 = 1256 - 1111.11$$

$$= 144.89$$

Use the sum of squares (SSR) in the following formula to obtain Kendall's W.

$$W = 12 \times SSR / K^2 N (N^2 - 1)$$

$$= 12 \times 144.89 / 9 \times 9 (81 - 1)$$

$$= 1738.68 / 6480 = 0.27$$

Table – 3 : Respondents opinions on marketing after digitalisation

Factors driving views on marketing through digitalisation	SA	A	SWA	RT	RT ²
Targets specific customers	10	1	1	12	144
Accessible to any business	8	1	1	10	100
Creates residual traffic	5	1	1	7	49
System deals with customers	5	-	-	5	25
Accurate information is provided	6	1	1	8	64
Electronic payment is easy	27	5	2	34	1156
Company provides services in different forms	7	-	-	7	49
Company enjoys great reputation	5	2	1	8	64
Company enjoys strong relationship with customer	7	1	1	9	81
Total	80	12	8	100	1732

Source : Field Survey

Note : SA - Strongly Agree, A - Agree, SWA - Somewhat Agree, RT - Row Total

$$SSR = \sum RT^2 - (\sum RT)^2 / N$$

$$= 1732 - (100)^2 / 9 = 1732 - 1111.11$$

$$= 620.89$$

Use the sum of squares (SSR) in the following formula to obtain Kendall's W.

$$W = 12 \times SSR / K^2 N (N^2 - 1)$$

$$= 12 \times 620.89 / 9 \times 9 (81 - 1)$$

$$= 7450.68 / 6480 = 1.1497$$

Finding the difference between 0.27 and 1.1497

$$\text{Now } w = 1.1497 - 0.27 = 0.8797$$

Test the significance of "W" by using the chi-square statistic.

$$x^2 = k (n-1) w$$

$$= 3 (10-1) 0.8797$$

$$= 3 \times 8 \times 0.8797 = 21.1128$$

Decision : At 8 d.f. with 0.05 level of significance the TV = 15.507. The calculated value being 21.1128 higher than the critical table value and. Therefore ‘w’ fails to accept H₀ and accepts H₁ and hence it is concluded that respondents are benefited highly after digitalization.

Table – 4 : Benefits of Digital Marketing in Banking Sector

Drivers of benefits	Weight	5	4	3	2	1	T	WA
	Likert scale	SA	A	N	DA	SDA		
Fake currency threat will be reduced with increasing cashless translations	f	70	15	15	-	-	100	VIII
	fw	350	60	45	-	-	455	30.33
Need to handle heavy cash is reduced	f	78	15	-	4	3	100	VI
	fw	390	60	-	8	3	461	30.73
Rural and urban gap is estimated	f	79	16	-	3	2	100	III
	fw	395	64	-	6	2	467	31.13
Digital banking is eco-friendly banking	f	80	10	5	2	3	100	V
	fw	400	40	15	4	3	462	30.80
Number of customers will be amplified	f	82	12	-	3	3	100	III
	fw	410	48	-	6	3	467	31.13
Creates opportunities to build a dynamic environment, changing space etc.	f	80	10	5	3	2	100	XI
	fw	400	40	15	6	2	443	29.53
Opportunity to address any issue of banking transaction quickly	f	75	10	8	4	3	100	IX
	fw	375	40	24	8	3	450	30.00
Facilitates customer segmentation	f	70	12	8	5	5	100	XV
	Fw	350	48	24	10	5	437	29.13
Creates more convenience to the customers	f	88	12	-	-	-	100	I
	fw	440	48	-	-	-	488	32.53
Creates prerequisites and favourable conditions for successful development of virtual enterprises	f	81	14	4	-	1	100	II
	fw	405	56	13	-	1	475	31.67
Allows banks to reach multi consumers	f	75	8	7	4	6	100	XIII
	fw	375	32	21	8	6	442	29.47
Increases the traffic to the companies websites	f	76	10	5	4	5	100	X
	fw	380	40	15	8	5	448	29.87
Facilitates the tracking and analysis of competitors actions	f	79	12	-	4	5	100	VII
	fw	395	48	-	8	5	456	30.40
Suitable for startups, small and medium sized companies	f	70	14	8	5	3	100	XI
	fw	350	56	24	10	3	443	29.53
High degree of personalization of advertising messages	f	71	13	6	6	4	100	XVI
	fw	355	42	18	12	4	431	28.53
Mobility of services	f	65	10	8	6	11	100	XVII

increased	fw	325	40	24	12	11	412	27.47
Creates greater transparency of business processes	f	72	10	8	4	6	100	XIV
	fw	360	40	24	8	6	438	29.20

Source : Field Survey

Likert scale : SA - Strongly Agree, A - Agree, N - Neutral, DA - Disagree, SDA - Strongly Disagree

Weights : 5 + 4 + 3 + 2 + 1 = 15 Weighted average = Total / sum of weights

Table 5 : Challenges of digitalization in Banking Sector

Objectives	Scale & Scale Value of ranks											T	MS	R
	Scale	I	II	III	IV	V	VI	VII	VIII	IX	X			
Increasing competition	f	65	10	5	5	4	3	2	3	2	1	100		
	fx	5330	700	315	285	212	141	84	108	60	18	7253	72.53	II
Lack of infrastructure facilities	f	63	8	6	5	5	4	3	3	2	1	100		
	fx	5166	560	378	285	265	188	126	108	60	18	7154	71.54	IV
Lack of banking habit in some parts of urban Bangalore	f	58	14	6	5	3	4	3	2	3	2	100		
	fx	4756	980	378	285	159	188	126	72	90	36	7070	70.70	VII I
Lack of financial literacy	f	59	15	6	4	4	3	2	2	3	2	100		
	fx	4838	1050	378	228	212	141	84	72	90	36	7129	71.29	V
Low volume of transactions	f	50	13	8	5	6	5	4	3	4	2	100		
	fx	4100	910	504	285	318	235	168	108	120	36	6784	67.84	X
Technology upgradation	f	60	10	6	5	4	5	3	4	2	1	100		
	fx	4920	700	378	285	212	235	126	144	60	18	7078	70.78	VII
Attracting app perfection	f	58	15	4	6	5	3	4	2	-	3	100		
	fx	4756	1050	252	342	265	141	168	72	-	54	7100	71.00	VI
Cybercrime	f	70	14	3	2	4	2	3	-	-	2	100		
	fx	5740	980	189	114	212	94	126	-	-	36	7491	74.91	I
Higher cost of financial services at Urban Center	f	52	19	4	3	5	4	4	3	2	4	100		
	fx	4264	1330	252	171	265	188	168	108	60	72	6878	68.78	IX

Creating valuable content	f	61	14	5	6	4	3	2	2	2	1	100		
	fx	5002	980	315	342	212	141	84	72	60	18	7226	72.26	III

Source : Field Survey

Note : Mean Score = Total Score / No. of respondents

Table – 6 : Per cent position and Garrett Values

Sl.No.	100 (Rij – 0.5) Nj	Calculated value	Current value
1	100(1-0.5) / 10	5.00	82
2	100(2-0.5) / 10	15.00	70
3	100(3-0.5) / 10	25.00	63
4	100(4-0.5) / 10	35.00	57
5	100(5-0.5) / 10	45.00	52
6	100(6-0.5) / 10	55.00	47
7	100(7-0.5) / 10	65.00	42
8	100(8-0.5) / 10	75.00	36
9	100(9-0.5) / 10	85.00	29
10	100(9-0.5)/10	95.00	18

Source : (1) Subhash Vadgale (2016). Village consumer behaviour towards perishable goods. A study with respect to Ahmednagar district of Maharashtra, Pezzottaite Journals, 5, (3) 2286-2287. (2) <https://pd4pro.com.edu>