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Investigating the Role of Customer Perception and Satisfaction Towards Adoption of Digital Banking Services

S. Gnanavel[1,*], M. A. Krishnamurthy[2]

[1,2]Department of Commerce, Shanmuga Industries Arts and Science College, Tiruvannamalai, Vellore, Tamil Nadu, India.
gnanavelrsg@gmail.com[1], krishmorty@gmail.com[2]

Abstract: According to the recommendations that were made by the Rangarajan committee and the Narasimhan committee, respectively, the Indian banking sector was urged to put more emphasis on technological improvements because of the enormous number of consumers that it serves. It is now possible for financial institutions to provide their services online due to the rapid development of new technology and the increasing availability of internet connectivity. This research aims to investigate the factors that influence consumers' perceptions of digital banking services (DBS) and to assess the extent to which these perceptions relate to the overall satisfaction of customers with DBS. Specifically, the research will assess the level of customer satisfaction with DBS. To collect responses from customers of commercial banks in both rural and urban areas of the Tiruvannamalai district, the researcher employed a convenience sampling approach, which resulted in the collection of 422 usable samples. It was established through factor analysis and structural equation modelling that the level of satisfaction consumers has with DBS is strongly influenced by the way they perceive the firm.

Keywords: Digital Banking Services (DBS); Convenience Sampling; Narasimhan Committee; Customer Perception; Technological Innovations; Rangarajan Committee; Commercial Banks.

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1. Introduction

The number of customers in the Indian banking system compelled them to adopt technological innovations in line with the recommendations of the Rangarajan committee and the Narasimhan committee, respectively. The advancement of technological innovations and internet connectivity has motivated banking institutions to offer their services online. Banking customers perceive that the development and growth of technology have brought about a revolution in connecting all types of commercial banks, thereby enhancing customer convenience [1]. The introduction of core banking solutions among commercial banks motivated consumers to distinguish between the ideas of digital banking services (DBS) and further augment their technology to connect all their mobile phones to their banking operations [2]. Other electronic gadgets, such as computers and laptops, are also well-connected to all banking operations and retail activities of customers. The globalisation and liberalisation

[*]Corresponding author.

of the Indian economy and banking sector welcome foreign players into the Indian banking system, offering customers more options for quick services and convenience [3]. In the present technological world, banking customers perceive that DBS is useful for them to conduct all their banking operations, including retail activities, bill payments, investments, and retail transactions, through their mobile technology and digital banking services. The meticulous observations of customers on technological development led them to perceive that foreign banks introduced new technologies and innovative banking ideas [4].

The rapid growth in the number of clients in rural and urban areas of a great nation like India requires technological support for the smooth maintenance of customer relationship management, as well as to ensure customer satisfaction [5]. The perceived prestige and lifestyle of customers play a significant role in leveraging the advantages of technology, such as efficient DBS. Generation gaps among customers can sometimes hinder the growth and development of technological facilities in all types of banks, including public, private, and foreign banks [6]. The digital banking components, such as the mobile banking system, Internet banking system, and core banking solutions, are very attractive to customers, who perceive that these gadget-based operations of DBS offer comfort and convenience in their daily banking transactions [7]. The extraordinary growth and development of the digital banking system have been closely linked to online marketing, with a notable impact on national GDP. In this scenario, the present research focuses on identifying the factors that affect customer perception of DBS and their subsequent impact on measuring customer satisfaction levels.

2. Literature review

Customers of commercial banks are highly impressed by the quick and efficient services of DBS. The age of customers plays a significant role in influencing their perceptions of the advantages and disadvantages of DBS offered by commercial banks. Customer perception of DBS depends on the cooperation of customers and their maintenance of customer relationship management between banks and customers [8]. The periodic interaction between bankers and customers is beneficial for implementing significant technological changes in digital banking services, thereby providing the best customer satisfaction. The role of service charges, efficient mobile connectivity, and internet connectivity in the growth and expansion of DBS in the banking sector. The current generation of technology in the banking system is connected to customers' mobile phones, which motivates them to conduct their banking transactions regularly, proving the association between client perception and DBS's satisfaction level. It has been ascertained that customer satisfaction, service charges, conveniences, and quick services are influenced by client insight on DBS, particularly the secure system and safe banking transactions [9]. It is further found that the complaint redress system and its perception are crucial in providing the best level of customer satisfaction.

All the problems faced by clients on DBS include a lack of connectivity, a slow systematic approach, high service charges, and a lack of interaction with service providers. Most DBS customers are dissatisfied with the CRM maintenance. The specific connection of the DBS to the retailers also irritated the customers, and they are seeking fast and efficient DBS [10]. Investigated the significant influence of client perception on DBS, namely customer connectivity with the digital banking system, lifestyle perception, and perceived prestige of customers in using the DBS for their retail marketing and shopping [11]. The study also reveals that most DBS clients expect convenience banking from their preferred locations without any interruption to internet speed [12]. Satisfaction among rural payment bank users was concluded, with the operators being content with the 24/7 facilities. Mobile banking services are used because they are more accessible [13]. PBS needs to enhance its technology and security to improve facilities. Diminishes functioning costs, fixed costs to the bank, and opportunity costs to their clients [14].

2.1. Research Gap

The researcher primarily analysed three research gaps that international researchers often overlook:

- What are all the factors directly influencing the customers to perceive the notions of DBS?
- Is there an association between client perception of DBS and customer satisfaction?
- Do the factors influencing DBS determine the frequent usage of DBS by the clients?

2.2. Objectives of the Study

The above-mentioned research gaps lead to the following aims of the research:

- To identify the factors of customer perception towards digital banking services.
- To measure the association between factors of customer perception and their level of satisfaction towards DBS.

2.3. Hypotheses

The above-mentioned research gaps and objectives of the researcher lead to the construction of the following hypothesis:

- There is a significant difference among the factors of customer perception towards digital banking services.
- There is a significant influence of customer perception on customer satisfaction with digital banking services.

3. Methodology

This research is based on primary information obtained from DBS customers in commercial banks. The primary data was easily obtained from the respondents using a well-structured questionnaire, which comprises three sections: demographic details and banking details of customers, followed by customer perceptions of digital banking services. The third part is dedicated to customer satisfaction, examining various components. The first part of the questionnaire comprises optional, closed-ended questions, whereas the second and third parts consist of statements on a five-point Likert scale. In the second part of the five-point Likert scale, the responses range from "strongly agree" to "strongly disagree." In contrast, the third part of the five-point Likert scale ranges from "highly satisfied" to "highly dissatisfied." Most of the statements in the questionnaire are derived from literature reviews from the national and international levels. The researcher also exploited the secondary data from journals, magazines, annual reports of commercial banks, and government reports.

3.1. Pretest and Pilot Study

After formulating the questionnaire, the researcher intended to conduct a pretest and pilot study to assess the reliability and validity of the research instrument. At the initial stage of pretesting, the researcher interacted with subject experts, statistical experts, bankers, and bank customers to precisely ascertain the components and perceptions of digital banking services offered by commercial banks. After these interactions, the researcher made slight modifications according to the practical suggestions of bankers and customers. After conducting the pretest of the questionnaire, the researcher conducted a pilot study by getting responses from 100 customers in both urban and rural areas of Tiruvannamalai district. The researcher applied the normal distribution method to check the normality of the data regarding optional type questions in the first part. In contrast, Cronbach's alpha was used to assess the statements on a five-point Likert scale, yielding a value of 0.908. The derived value is greater than the expected value of 0.75, indicating that the respondents exhibited a 90.8% variance in their responses to all statements regarding customer perception and satisfaction towards DBS. This demonstrates the high reliability of the questionnaire and paved the way for circulating the questionnaire for the main study.

3.2. Sample Selection

The researcher employed a convenience sampling method to collect responses from customers of commercial banks in both rural and urban areas of the Tiruvannamalai district. The researcher employed a convenience sampling method to identify potential customers who were willing to express their opinions in an unbiased manner. The application of random sampling attracted some customers who were not interested in completing the research instrument in an unbiased manner. The researchers distributed 50 questionnaires to the nine zones of Tiruvannamalai district and obtained 422 usable samples. After obtaining 422 usable samples through the convenience sampling method, the researcher carefully entered and numerically coded them in the SPSS package version 23 to analyse the data structurally.

3.3. Data Analysis

The researchers employed exploratory factor analysis, confirmatory factor analysis, linear multiple regression analysis, and structural equation modelling to validate the factors influencing the adoption of DBS offered by commercial banks in the study area. The EFA is useful for deriving the factors, and the CFA is useful for confirming the factors derived. The application of linear multiple regression analysis and structural equation modelling can easily identify the relationship between the factors of customer perception of digital banking services and their subsequent impact on customer satisfaction in the context of digital banking services.

4. Analysis and Discussion

After reviewing the literature on DBS and customer perception of different types of DBS, it became clear that certain issues directly influence customers' adoption of DBS. Therefore, the researcher extracted 30 variables from the literature reviews regarding various factors directly linked to the technologically advanced DBS practices prevalent among commercial bank customers. These 30 variables are presented to the researcher in the form of statements on a five-point Likert scale, and respondents are asked to express their opinions on these psychological scales. After obtaining the responses, the researcher aimed to precisely identify the factors influencing the adoption of digital banking service practices among customers. Therefore, the researcher employed exploratory factor analysis on the 30 variables related to the perception of digital banking services among commercial bank customers in the study area, yielding the following results.

Table 1: KMO and Bartlett's test for customer perception

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.656
Bartlett's Test of Sphericity	**Approx. Chi-Square**	4958.029
	Df	435
	Sig.	.000

From Table 1 above, it is found that the Kaiser-Meyer-Olkin value and Bartlett's test of sphericity, along with the approximate chi-square values, are statistically significant at the 5% level, indicating that the 30 variables are normally distributed, as perceived by the customers of commercial banks. The application of exploratory factor analysis reduces the 30 variables into predominant factors as shown in the following table.

Table 2: Number of factors extracted for customer perception

Component	**Initial Eigenvalues**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	5.555	18.517	18.517	2.889	9.629	9.629
2	3.128	10.427	28.944	2.625	8.750	18.380
3	2.656	8.852	37.796	2.569	8.565	26.945
4	1.842	6.140	43.936	2.413	8.045	34.989
5	1.442	4.808	48.744	2.148	7.160	42.150
6	1.371	4.571	53.315	1.852	6.172	48.322
7	1.294	4.312	57.627	1.771	5.904	54.225
8	1.140	3.802	61.429	1.496	4.988	59.213
9	1.086	3.620	65.049	1.444	4.812	64.026
10	1.023	3.409	68.457	1.329	4.432	68.457
11	.998	3.327	71.785			
12	.857	2.858	74.643			
13	.842	2.807	77.449			
14	.779	2.596	80.045			
15	.678	2.259	82.304			
16	.645	2.149	84.453			
17	.594	1.980	86.432			
18	.526	1.753	88.186			
19	.507	1.689	89.875			
20	.468	1.561	91.436			
21	.439	1.463	92.898			
22	.382	1.273	94.172			
23	.326	1.086	95.258			
24	.279	.930	96.188			
25	.259	.864	97.052			
26	.256	.852	97.904			
27	.192	.641	98.546			
28	.180	.601	99.147			
29	.142	.474	99.621			
30	.114	.379	100.000			

From Table 2 above, it is observed that 30 variables are reduced to 10 predominant factors, each comprising three underlying variables. The total variance of 30 variables in the cumulative form is found to be 68.457% which is above the benchmark value of 40% to confirm the existence of normality of 30 variables, as well as 10 predominant factors with high explanatory power on the factors influencing the customers in opting for the digital banking services offered by the commercial banks. After deriving these 10 factors, which are predominant in influencing the customers, it is found that each factor consists of three underlying variables, which ultimately lead to the computation of total average scores. These underlying variables clearly revealed the names of the factors: quick services, security system, customer connectivity, perceived prestige, shopping connectivity, convenience, mobile connectivity, service charges, service provider interaction, and complaints redress, respectively. These 10 derived factors are crucial for validation in determining the existence of factors that directly influence customer perception of digital banking services. The computation of factors and the scores ultimately leads to the exploitation of another validity tool, namely, confirmatory factor analysis. The CFA is useful for confirming the 10 factors derived from EFA through the existence of fit indices, benchmark values, and their respective correlation coefficients between observed and unobserved factors of DBS. The following table and diagram present the consequences of applying confirmatory factor analysis to the 10 factors of digital banking services (Figure 1).

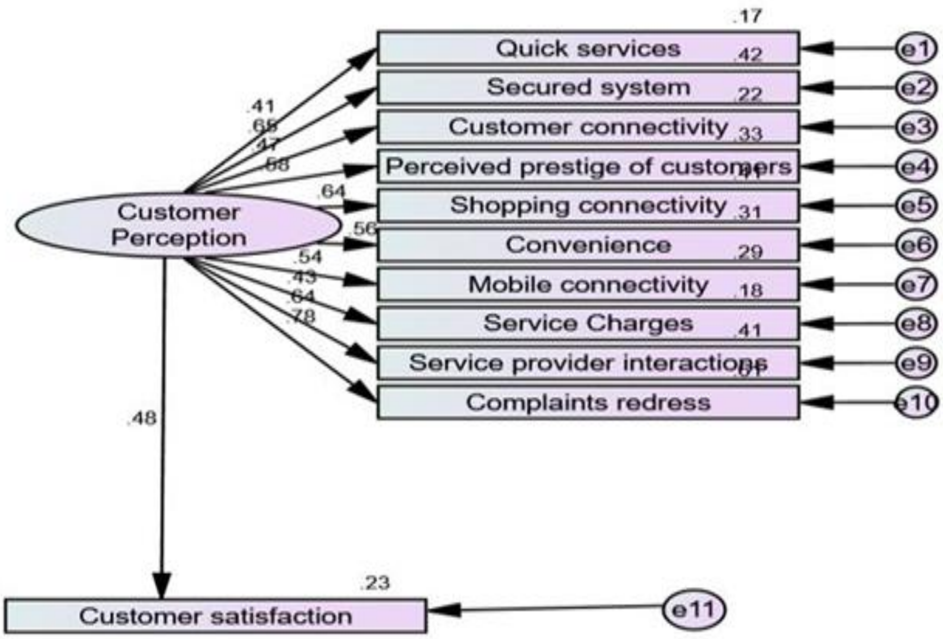

Figure 1: Structural equation model of customer perception and customer satisfaction

It is found that quick services, a secure system, customer connectivity, perceived prestige, shopping connectivity, convenience, mobile connectivity, service charges, service provider interaction, and complaint redress are the observed factors, and they are well correlated with the unobserved factor affecting customer perception of digital banking services. In fact, these factors and the validation can be identified in the table, which includes six fit indices: chi-square value, P-value, comparative fit index, goodness-of-fit index, normed fit index, and root mean square error of approximation. These fit indices meet the benchmark values, indicating that 10 factors were derived from the EFA based on customer responses using digital banking services (Table 3).

Table 3: Fit indices for the model of customer perception and satisfaction of digital banking services

No.	Fit indices	Values	Benchmark values
1	Chi-square	20.354	-
2	P-value	0.412	>.05
3	Goodness of fit index (GFI)	0.989	>.9
4	Comparative fit index (CFI)	0.987	>.9
5	Normed fit index (NFI)	0.986	>.9
6	Root Mean Square Error of Approximation (RMSEA)	0.072	<=0.08

Similarly, the researcher identified the total average scores of customer satisfaction and considered them as a dependent factor, based on the opinions of customers of digital banking services in the study area. In this case, all 10 factors of customer perception regarding digital banking services are considered as independent variables. Therefore, the scenario of a set of all independent variables and the dependent factors prompts the researcher to apply linear multiple regression analysis to determine the influence of factors affecting customer satisfaction levels with the adoption of digital banking services. The results of the linear multiple regression analysis are clearly presented below:

Table 4: Correlation between customer perception and satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.557[a]	.311	.301	.52013

From Table 4 above, it is evident that the R-squared values and adjusted R-squared values exceed the expected value of 0.3, indicating that the factors influencing the adoption of digital banking services by commercial banks also impact their customers' level of satisfaction with these services. The following analysis of variance table provides further support for this.

Table 5: Computation of F-statistics for customer perception and satisfaction

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	86.683	10	8.668	32.041	.000[b]
	Residual	192.353	711	.271		
	Total	279.036	721			

From the above Table 5, it is found that the F-values and P-values are statistically significant at 5% level therefore it proves their intrinsic relationship between 10 factors affecting the customer perception on digital banking services and their level of satisfaction, it immediately arises the cause of measuring the individual influence of all these 10 factors on their level of satisfaction of customers in the form of their contribution. It is explicitly presented in the following individual coefficient table.

Table 6: Individual influence of factors influencing customer perception of digital banking services

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.039	.191		10.693	.000
	Quick services	-.019	.032	-.021	-.611	.542
	Secured system	.311	.033	.382	9.545	.000
	Customer connectivity	-.089	.027	-.121	-3.252	.001
	Perceived prestige of customers	.201	.030	.272	6.645	.000
	Shopping connectivity	-.042	.035	-.053	-1.195	.232
	Convenience	-.069	.040	-.067	-1.722	.085
	Mobile connectivity	.120	.030	.152	3.948	.000
	Service Charges	.078	.026	.111	3.048	.002
	Service provider interactions	-.068	.039	-.075	-1.732	.084
	Complaints redress	.110	.058	.092	1.894	.059

4.1. Dependent Variable: Customer Satisfaction

From Table 6 above, it is evident that among the 10 factors, these factors significantly influence the level of customer satisfaction, as indicated by the substantial beta values, T values, and p-values. Therefore, it is established that the perception of digital banking services among customers is not a unique phenomenon. In contrast, it is the combination of several factors that determines the level of customer satisfaction. This leads to the testing of hypotheses, namely.

- There is a significant difference among the factors that affect customers' adoption of digital banking services.
- There is a significant influence of customer perception of digital banking services on their level of satisfaction.

The subsequent application of confirmatory factor analysis and linear multiple regression analysis ultimately reveals the effect of the structural equation model. It confirms that the hypotheses mentioned earlier are supported and accepted at a 95% confidence level.

5. Discussion

The rigorous statistical analysis clearly indicated that the adoption of digital banking services offered by commercial banks directly affects customer perception, in the form of their expectations and the quick services they receive from their banks. The customers perceived that technological digital banking services could be used by them when commercial banks offer a 100% secure system in their digital banking services. Customers perceived that lifestyle perception and prestige can be derived from the frequent use of online digital banking services offered by commercial banks. Customers of digital banking services perceive that customer connectivity is essential to demonstrate the consolidated relationship between banks and customers. Most consumers of commercial banks use their digital banking services for retail shopping, and they expect the best shopping connectivity to ultimately lead to complete shopping satisfaction. Most commercial banks offer digital banking services to ensure convenience for their customers, enabling them to access their accounts via mobile phones using a secure system. Service providers of digital banking services often interact with their customers through social media and other mobile messaging platforms to inform them of new products for the customer's convenience. The primary expectation of customers in adopting digital banking services from commercial banks depends on the dynamic nature of these banks in addressing customer complaints promptly.

6. Conclusion

The paper is also based on a study that shows a strong relationship between customer perception and satisfaction, which helps validate the factors influencing customer adoption of digital banking services. The research concludes that the digital banking services offered by commercial banks depend on several factors, and their direct usage for customer convenience is the most cost-effective option. These findings and conclusions ultimately lead to the following suggestions for commercial banks and customers to maintain their digital banking services at a level of satisfaction. It is recommended that commercial banks focus on technological advancements and incorporate advanced technologies, similar to those of developed countries, to enhance the speed and convenience of their services for customers. Customers of digital banking services must be aware of all security systems and their mobile connectivity to ensure safe banking transactions. Customers must periodically interact with service providers to identify new products they introduce, and they must also lodge their complaints with the service providers without hesitation to ensure their safety and security in each financial transaction through their commercial banks.

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