

DEVELOPMENT OF KEY DIMENSIONS REGARDING PROBLEMS IN E-BANKING SERVICES THROUGH EXPLORATORY FACTOR ANALYSIS IN LUCKNOW DISTRICT

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Abstract:

In contrast to old-style banking, internet banking comprises non-human communications between customers and online bank info structure. Customer's satisfaction, customer retaining and new customer acquirement are the main factors in e-banking system. Customer's behavior in banking has transformed partly as a result of change in the amount of spare time available to individuals. Mobility, independence of time and place has become key words in customer banking. The features of E-banking comprise 24 hours and 7 days availability, immediate access and the lack of physical border. Indeed internet has been one of the key drivers in supporting E-banking in banking sector.

The main objective of this paper is to identify the leading problems of bank customer while using E-banking services in Lucknow district. By using SPSS 20.0 an exploratory factor analysis technique was used to extract the primary problems faced by bank customers in accessing E-banking services. The analysis is based on principal component method with eigen value greater than 1. Through this analysis four dimensions were found viz Locational Disadvantage of ATMs, Lack of knowledge, Support services and Availability and functionality of ATM machines. KMO test is used to test the suitability of the factor analysis and it validates reliability of all the dimensions extracted as value of KMO test is more than .5. Bartlett test is also used to measure the significance of correlation between the variables under factor analysis.

Key words: EFA, Latent variables and Reliability test

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Introduction:

Internet banking is highly convenient as it has many advantages over disadvantages. Moreover, the advantages outshine disadvantages. E-banking is one of the technologies which is getting appreciation around the globe. It is the computerized delivery of the new and traditional banking products and amenities; directly to the customers, through electronic interactive communication channels. Electronic banking contains the systems. These systems empower financial institution, the customers, business and individuals.

These systems help in accessing accounts, conducting business, gaining information on financial products and providing services, through a public or private network via internet. The research deals with rising E-banking problems in Lucknow district while using E-banking services. There are many banks which are providing these amenities to the customers. This study will be more beneficial to banks in knowing the desirable information regarding usage and various problems faced by service users while availing E-banking services like-operations of ATMs, NEFT, RTGS, funds transfer etc. This study will become a source of info for future researchers for studying the performance of E-banking in National, Private and Co-operative sectors at rural, semi-urban and urban areas in different districts, states for different E-banking facilities.

Objective of Research:

This research paper focuses on the problems faced by service users while accessing internet banking. Through this paper various dimensions related to E-banking problems are developed by using Exploratory factor analysis.

Tools used:

As a technique EFA is used to develop core problems of E-banking services in the form of latent variables (also referred as factor).

Research Methodology:

Research design is based on Descriptive research. Sample size is determined by using sample calculator available on Google. Sample size of 284 has been identified by using sample calculator available on Google. Researcher had decided the sample size as 300 after considering literature review and expert opinion. For the collection of sample Lucknow district was chosen which was after divided in five zones north, south, east west and central zone. Tracking customers using internet banking was difficult due to confidentiality of banks database so random sampling technique was chosen. Data was collected through Google form through structured questionnaire.

Sampling Instrument development:

10 questions have been asked on 5 point rating scale related to E-banking problems (please refer to Annexure (Questionnaire) for detailed question.

Research process:

- Demographic profile
- Exploratory Factor Analysis
- Reliability test

Summary of demographic profile:

Approx. 58% of E-banking customers were male and 42% were female. 40% respondents are salaried class and rest of the respondents were from business, agriculture, professionals or non-working. 42% respondents were graduate, 37% were post graduate and 21% have education up to intermediate only. 45% respondents have their accounts in nationalized bank and 48% respondents have account in both types of bank nationalized and private bank.

Exploratory Factor analysis:

1. Factor analysis is a technique of reducing data complexity by reducing a large set of variables in terms of few categories known as components or factor.
2. The technique allows the researcher to club variables / questions into factors on the basis of correlation between them and therefore the value factor is derived from summing up the value of the variable clubbed into the factor.
3. The meaning and name of such factor is subjectively decided by the researcher.
4. Factor analysis carries few terms to understand. They are as under:

A. Factor loading: - It represents how closely the variables are related to each one of the factor extracted. It is a correlation between factor & variable.

B. Communality (h^2) shows how much of each variable is accounted for the underline factor taken together. (Communality (h^2) of the i^{th} variable) = (i^{th} factor loading of factor A) 2 + (i^{th} factor loading of factor B) 2 +

Note: Thus, the squared factor loadings are called communalities which are very crucial measure to find out the reliability of individual indicators referred as Indicator Reliability

C. Eigen value: - Eigen value is the sum of squared values of factor loadings relating to a factor.

Eigen value represents the relative importance of each factor in accounting for particular set of variables being analyzed.

D. Eigen value of factor A = (Factor loading of i^{th} variable with factor A) 2 + (Factor loading of j^{th} variable with the factor A) 2 +

Conclusion: In Factor analysis we consider the Eigen value greater than 1 using Principle Components method followed by Variance rotation method to extract components or factor

5. Rotation: Rotation in the context of factor analysis is something like looking data from different angle from statistical point of view.

- Different rotations give results that appear to be different but are taken as equal neither superior or inferior to one another.
- If the factors are independent orthogonal rotation is done and if the factors are correlated an oblique rotation is done.
- Communality for each variable will remain undisturbed regardless of rotation but the eigen values change as result of rotation.

6. KMO Test: The KMO test is used to test the suitability of the factor analysis. This measure varies between 0 and 1. Values closer to 1 are better. KMO should be greater than 0.5 for suitability

7. Bartlett Test: Bartlett test measures the significance of correlation between the variables under factor analysis.

If the significance level is less than 0.05 then there will be significant correlation among the variables.

Factor Analysis:

Tool used: Factor analysis

(Package used: SPSS 20.0)

In the present Research work a 5-point rating has been done for observed variable to identify the dimensions of Key problem in e-banking services in the following paragraphs:

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.537
Approx. Chi-Square		562.044
Bartlett's Test of Sphericity	df	45
	Sig.	.000

Discussion:

1. This table shows that the $KMO > 0.5$ and therefore the model is suitable of the factor analysis and as $p\text{-value} < .05$ (5% is the level of significance) and therefore it is concluded that there is significant correlation between the variables under factor analysis. Thus, model is fit.

Communalities

	Initial	Extraction
Q 8_Rate the problems of e-banking services_Poor acquaintance about the usage of e-channels	1.000	.583
Q 8_Rate the problems of e-banking services_Number of ATMS not enough	1.000	.669
Q 8_Rate the problems of e-banking services_Inappropriate location of ATMs	1.000	.724
Q 8_Rate the problems of e-banking services_Pass word forgotten	1.000	.648
Q 8_Rate the problems of e-banking services_Absence of interest from customers	1.000	.750
Q 8_Rate the problems of e-banking services_Misuse of card	1.000	.740
Q 8_Rate the problems of e-banking services_Card misplaced	1.000	.691
Q 8_Rate the problems of e-banking services_Mechanical hurdles of ATMs and smart card	1.000	.542
Q 8_Rate the problems of e-banking services_Poor network	1.000	.631
Q 8_Rate the problems of e-banking services_Lack of self confidence	1.000	.694

Extraction Method: Principal Component Analysis.

Table -1

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.170	21.699	21.699	2.170	21.699	21.699	1.795	17.951	17.951
2	1.714	17.137	38.835	1.714	17.137	38.835	1.648	16.476	34.427
3	1.546	15.456	54.292	1.546	15.456	54.292	1.641	16.407	50.833
4	1.243	12.429	66.721	1.243	12.429	66.721	1.589	15.888	66.721
5	.958	9.576	76.297						
6	.603	6.029	82.326						
7	.535	5.349	87.675						
8	.458	4.585	92.260						
9	.440	4.402	96.662						
10	.334	3.338	100.000						

Extraction Method: Principal Component Analysis.

Scree Plot

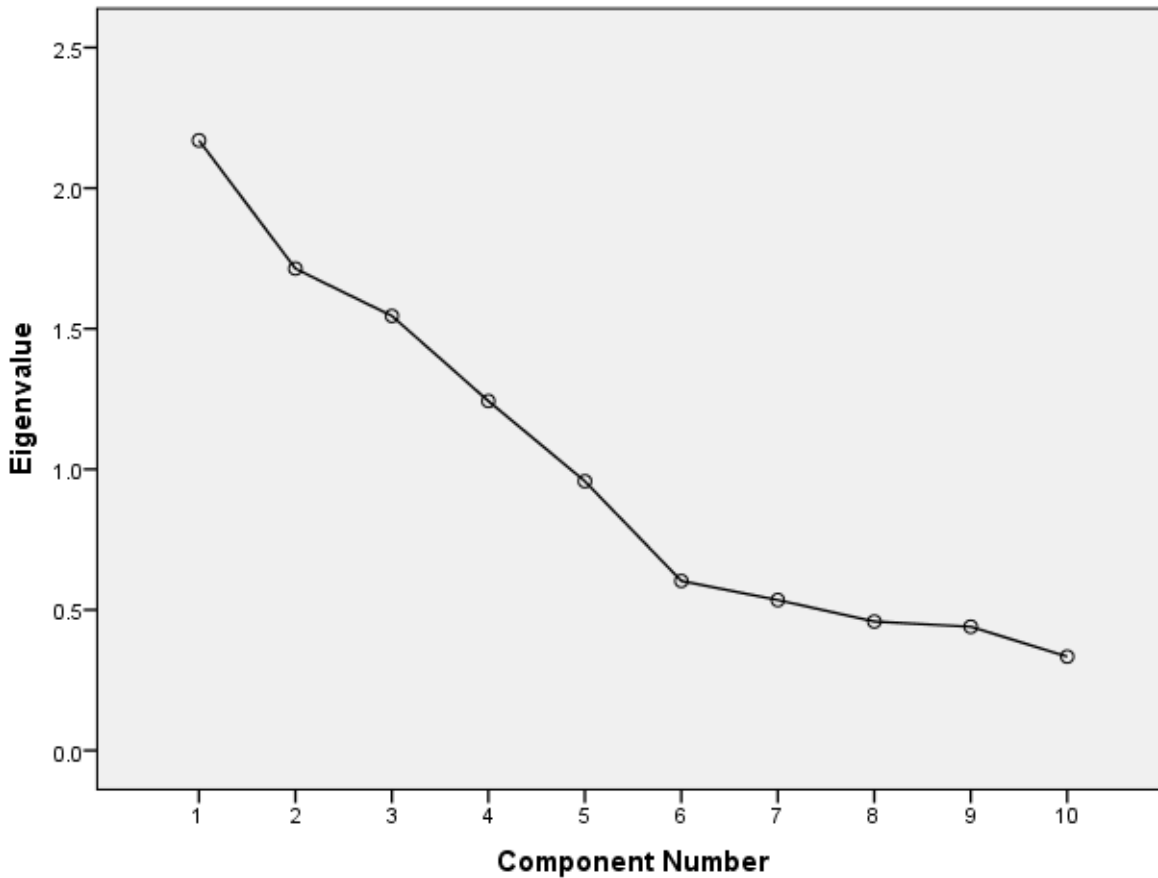


Table 2**Rotated Component Matrix^a**

	Component			
	1	2	3	4
Q19_Rate the problems of e-banking services_Inappropriate location of ATMs	.845	-.012	-.058	.076
Q19_Rate the problems of e-banking services_Poor network	.758	-.113	-.088	-.190
Q19_Rate the problems of e-banking services_Lack of self confidence	.583	.497	.275	-.177
Q19_Rate the problems of e-banking services_Absence of interest from customers	-.138	.831	.169	-.111
Q19_Rate the problems of e-banking services_Misuse of card	.051	.808	-.248	.154
Q19_Rate the problems of e-banking services_Card misplaced	-.089	-.110	.816	-.071
Q19_Rate the problems of e-banking services_Pass word forgotten	-.056	.160	.712	.335
Q19_Rate the problems of e-banking services_Poor acquaintance about the usage of e-channels	-.357	.015	-.515	.436
Q19_Rate the problems of e-banking services_Number of ATMS not enough	.052	.070	.073	-.810
Q19_Rate the problems of e-banking services_Mechanical hurdles of ATMs and smart card	-.060	.048	.141	.718
Variance explained	21.699	17.137	15.456	12.429

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Discussion:

1. The factor analysis shows that the problems of e-banking services are divided into four key dimensions which have eigen value of greater than 1 based principal component analysis and also these 4 dimensions collectively explain 66.72 % of problems observed through different variables. (Refer to Table 1)
2. Based on Loading and subsequent clubbing of variables, factors are identified, and the name is done to represent the characteristics of variables clubbed as under: (Refer to Table 2)
 - 1st Factor / Dimension: Locational Disadvantage of ATMs
 - 2nd Factor / Dimension: Lack of knowledge
 - 3rd Factor / Dimension: Support services
 - 4th Factor / Dimension: Availability and functionality of ATM machines

Conclusion and suggestions:

1. The above-mentioned factors are in the order of their contribution in explaining the problems of e-banking services measured through variance explained. (Please refer to last row of table 2)
2. We can conclude that as for as problems of e-banking services are concerned and since Debit card being ATM card is the most preferred channel and therefore the said problems can be categorized under following dimensions:
 - Locational Disadvantage of ATMs
 - Lack of knowledge
 - Support services
 - Availability and functionality of ATM machines
3. The only limitation in this research work is that the data is collected from Lucknow region only and therefore its findings might vary across other geographical regions.

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Annexure:**Research paper on****DEVELOPMENT OF KEY DIMENSIONS REGARDING PROBLEMS IN E-BANKING SERVICES THROUGH
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1. Name :
2. Gender : A- Male B- Female
3. Age group
A- Under 20 B- 20-40 years
C- 40-60 years D- 60 & above
4. Employment Status
A-Practising Professional B-Agriculturist
C-Businessman D-Salaried
E-Non-working/Pensioner
5. Educational background
A-Up to intermediate B-Graduate
C-Postgraduate / Professional
6. Yearly Income
A- Below 2.5 lakhs B- 2.5-5 lakhs
C- 5-10 lakhs D-10-20 lakhs
E -20 & above
7. Category of your bank: 1. Nationalized 2. Private 3. Both

9. PROBLEMS E-BANKING SERVICES (Rate between 1 to 5: 1 for highest and 5 for lowest))

Sl. No	Factors	Rank
1	Poor acquaintance about the usage of e-channels	
2	Number of ATMS not enough	
3	Inappropriate location of ATMs	
4	Pass word forgotten	
5	Absence of interest from customers	
6	Misuse of card	
7	Card misplaced	
8	Mechanical hurdles of ATMs and smart card	
9	Poor network	
10	Lack of self confidence	