

IT IMPRESSION ON THE DIMENSIONALITY OF THE BANKING SERVICE QUALITY - WHAT CUSTOMERS HAVE TO SAY?

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In the wake of Information Technology (IT) revolution and to withhold the pressure to provide quality services, it is imperative for the banks to infuse IT in their system for survival as well as growth. Conversely, customers' perceptions may be different from the beliefs and promises made by the banking institutions. This paper intends to address the bearing of the IT inclusion on the dimensionality of the banking services quality as perceived by the customers. Six dimensions of the service quality were explored viz. operational efficiency, convenience, assurance, experiencescape, service setting, and employee efficiency. The findings revealed that all these factors are highly affected by the diffusion of IT in the banking system.

Keywords: Banking, IT, Service quality, Factor analysis, Punjab.

Prologue

Global technology proliferation in the wake of diversified economic envisions has allured financial services institutions to change the dimensions of their marketing strategies. Responding to cut throat global competition and with the vision to offer multiplying benefits, the technology enabled/driven services are surpassing the 'Nice to have' phase to 'Need to have' services. Being informational in nature, financial services field is adapting technological spread with very fast pace, anticipating that it would facilitate rapid transmission of digitized information within and across borders, which is becoming increasing important for successful financial transactions (Bradley and Steward, 2002).

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Table 1: The List of Variables included in the study (parameters of banking service quality)

V1.	Improved product mix
V2.	Customized service/ Service as per customers' requirement
V3.	Secure transactions
V4.	Improved servicecape/ physical ambience
V5.	Prompt Information provision
V6.	Effective grievance handling
V7.	Increased comfort/ convenient operating hours
V8.	Easy Accessibility/any time service
V9.	Reduced cost
V10.	Easy Availability/any place service
V11.	Seamless operations/ less mistakes
V12.	Quick response
V13.	Modern equipments
V14.	Willingness of employees to service customers
V15.	Fast transactions
V16.	Dependable services
V17.	Availability of employees
V18.	Ensured Safety
V19.	Visually appealing materials (statements/ forms/pamphlets etc.)
V20.	Attractive screen layout and design
V21.	Service right the first time
V22.	Transaction within committed time
V23.	Employees always find time to respond customers
V24.	Knowledgeable employees
V25.	Instill confidence in customers
V26.	Individual attention to customers
V27.	Customers' best interests are served

Within financial services sector, the banking institutions represent one field where the inclusion of *Information Technology* (IT) has astounding effects on both its structure and operations. With the changing structure of banking industry, IT has been entrenched in both depth and width of banking operations. Inclusion of IT in banking services was a strategic decision taken by the top notches of banking industry that has today become the necessity for survival. The major reason behind this proliferation of technology is the profound benefits it offers to the customers. Majority customers are well aware of these

benefits, so are ready to accept these technology based services. The question lies in their level of adoption that is influenced mainly by their perceptions about the quality of these services. In this customer relationship centric era quality is the key mantra to attract and retain the customers. Service quality is a notion that has varied aspects and perspectives and conceptualized by many academicians, practitioners, and researchers in different ways (Gronroos, 1984; Parasuraman et al, 1985; Brady and Cronin, 2001; Juran, 1986; Crosby, 1989; Bergman and Klefsjö, 1994; Avkiran, 1994). Any service is considered as a quality service if it provides value to the customers in terms of time, cost and place propositions.

Today, the banks have technological driven delivery channels that provide convenience to customers in terms of accessibility and transacting with banks. Technology enabled clearing and settlement systems ensure better quality of internal processes or operations, thereby providing quicker services to the customers and other transacting bodies (inter banks and other institutions).

Problem Discussion

Considering all pull and push factors prevailing in this global competitive marketplace, banks are swiftly shifting to electronic platform employing Information Technology (IT) for providing financial services. To remain competitive yet socially responsible, they have to deliver value to the customers. The service quality is the common antecedent of value consequently customer satisfaction (Cronin and Taylor, 1992). The narrow examination of effect of technology embedment on the service quality in banking is the least talked about area. With the marked shift from traditional to electronic banking, the intention of this study is to examine empirically which dimensions of service quality are influenced by IT inclusion in banking services more significantly. Dimensions of service quality imply how customers evaluate the quality of any service.

Research approach

Explorative study has been carried out focusing basically on primary data. A sample size of 100 respondents was taken comprising customers of both private sector and public sector banks across three major cities of Punjab viz. Amritsar, Jalandhar, and Ludhiana. 12 major private sector and public sector banks based on profitability were considered and 3 customers of each selected bank in each city were surveyed. The data was collected through an extensive questionnaire. Due to sensitivity of data the questionnaires were personally presented and got filled through contacting walk-in customers at the bank

premises. Care was taken to fetch out genuine opinions of the customers. The opinions of customers on different variables reflecting quality of service were measured on a five point likert scale from 5 to 1 depending upon the agreeability on each variable (5 for highly agree followed by 4 for agree, 3 for neutral, 2 for disagree, and 1 for strongly disagree). All variables were coded likewise.

Methodology

The multivariate statistical technique of Factor analysis has been used for the aforesaid objective to determine patterns of interrelationships among variables representing the dimensions of service quality that are influenced by IT inclusion in banking. Factor analysis is a technique primarily employed for summarization and data reduction when there are a large number of variables under analysis (Hair, et al., 1987). Based upon the correlations among these variables, it derives underlying dimensions that help the analyst describing the data in a much smaller number of items.

With the purpose of factor analysis specified, the preliminary step for factor analysis is the definition of the set of variables. For the present study, the variables had been majorly derived from the earlier studies conducted both in India and abroad in varied fields. The first step in conducting the factor analysis is to construct the correlation matrix showing the intercorrelations among the variables (R-type) or among the respondents (Q-type). Next, the appropriateness of the factor analysis is examined in terms of presence of significant correlations among variables. For this purpose, either the Bartlett test of sphericity or Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is used. The correlation matrix of the present study reflected *KMO* of 0.838 (>0.5) showing high adequacy and considered as 'meritorious' as given by Kaiser, 1974.

The next step in the factor analysis is to decide upon the method of extracting the factors (common factor analysis versus principal components analysis). For the present study, the *principal components analysis* has been employed since the primary purpose of the study is to determine the minimum number of factors that would account for maximum variance in the data. When using component analysis full variance is brought in the factor matrix while in the common factor analysis only common variance (leaving error and special variance) is taken into consideration.

Table 2: Eigen values and percentage of variance of different variables

Component	Initial Eigen values		
	Total	% of Variance	Cumulative %
1	9.319	34.513	34.513
2	2.107	7.807	42.316
3	1.762	6.524	48.840
4	1.369	5.071	53.912
5	1.333	4.935	58.847
6	1.211	4.487	63.334
7	.996	3.689	67.023
8	.967	3.582	70.605
9	.894	3.313	73.917
10	.799	2.959	76.877
11	.745	2.761	79.877
12	.661	2.448	82.085
13	.574	2.127	84.212
14	.512	1.895	86.107
15	.500	1.853	87.959
16	.439	1.626	89.586
17	.421	1.559	91.145
18	.388	1.436	92.581
19	.372	1.376	93.957
20	.297	1.101	95.058
21	.269	.996	96.054
22	.241	.892	96.946
23	.225	.835	97.781
24	.202	.747	98.528
25	.162	.600	99.128
26	.125	.461	99.589
27	.111	.411	100.000

Extraction Method: Principal Component Analysis

After deciding about the method of extraction -decision should be made regarding the criterion for the number of factors to be extracted. The most commonly used method is the latent root criterion. Here, latent roots or eigen values are calculated for each variable that represent the amount of variance accounted for by a factor and only factors having eigen values greater than 1 are considered significant. In table 2, we see that six factors are showing eigen value greater than 1 hence, extracted. While extracting factors, orthogonal technique was used. To be orthogonal means, after extracting first factor, the second factor is extracted provided the effect of the first factor has been removed from the data in terms of variance. Every factor represents a linear combination of original variables.

Table 3: Extraction Sums of Squared Loadings

Factor	Total	% of Variance	Cumulative %
1	9.319	34.513	34.513
2	2.107	7.803	42.316
3	1.762	6.524	48.840
4	1.369	5.071	53.912
5	1.333	4.935	58.847
6	1.211	4.487	63.334

The initial factor solution (unrotated factor solution) extracts factors in the order of their importance. As we can see in table3, factor 1 is accounting for largest portion of the variance in the data (34.513%) with remaining each accounting for successively smaller portions of variance. To redistribute the variance from earlier factors to later ones and to make the factor solution more meaningful, rotation of factors was applied. This is an important tool in interpreting factors wherein the axes of the factors are rotated until some other more desirable position has been reached. The factors can be rotated using either orthogonal (the axes are maintained at 90°) or oblique (rotated otherwise) rotation. The most popular algorithm for orthogonal rotation is VARIMAX that was also employed for the current study. The results of the rotation can be seen in the Table 4 where the variances accounted for by the extracted six variables have been redistributed among them.

Table 4: Rotation Sums of Squared Loadings

Factor	Total	% of Variance	Cumulative %
1	3.626	13.428	13.428
2	3.439	12.739	26.167
3	3.417	12.657	38.824
4	2.614	9.681	48.505
5	2.013	7.455	55.960
6	1.991	7.373	63.334

Interpretation of the factors

The final phase of factor analysis is the interpretation of the results. The analyst's job is to select which factor loadings are worth considering for the final result. Factor loadings in the factor matrix (refer table 5) represent the correlation of each variable with the factor and the squared loadings represent the variable's variance accounted for by the factor, with higher loading making the variable more representative of the factor (Arora and Malhotra, 1999). We chose those factor loadings which are greater than 0.45 (ignoring the signs) and loaded them on the extracted factors. The interpretation also involves naming of the factors so extracted. The naming has no rule and depends solely on the analyst's intuition. Attempt is always made to represent every component of the factor but this label usually reflects the variable whose factor loading is the highest.

Ranking of the factors

In order to find out the degree of importance of different dimensions of service quality in the wake of IT, the factorwise average scores have been analysed. This analysis is based upon the customers' perceptions about different variables.

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Table 5: Rotated Factor Matrix

	Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
V1	Improved product mix	.194	-.030	.159	-.066	.826	.060
V2	Customized service	.047	.383	.034	.255	.675	.059
V3	Secure transactions	.639	-.071	.357	-.019	.331	-.168
V4	Improved service cape	.185	.392	-.009	.177	.523	.133
V5	Prompt Information provision	.225	.655	.248	.078	.101	.230
V6	Effective grievance handling	.370	.200	.641	.010	.021	.165
V7	Increased comfort	.036	.826	.179	.024	.142	.069
V8	Easy Accessibility	.108	.783	.235	.117	.146	-.062
V9	Reduced cost	.526	.007	.103	.356	.306	.030
V10	Easy Availability	.430	.501	.078	.170	.017	-.050
V11	Seamless operations	.774	.214	.076	.071	.023	.224
V12	Quick response	.624	.340	.200	.157	.110	.240
V13	Modern equipments	.452	.416	-.017	.462	.050	.186
V14	Willingness of employees to service customers	.002	.183	.365	.597	-.125	.252
V15	Fast transactions	.433	.581	-.013	.504	-.043	.152
V16	Dependable services	.300	.174	.216	.508	.213	.084
V17	Availability of employees	.109	-.046	.242	.744	.088	-.009
V18	Ensured Safety	.534	.110	.567	.183	-.074	-.005
V19	Visually appealing materials	.088	.332	.598	.428	-.034	-.060
V20	Attractive screen layout and design	.146	.293	-.111	.485	.233	.230
V21	Service right the first time	.483	.228	.187	.195	.239	.250
V22	Transaction within committed time	.549	.169	.257	.085	.216	.404
V23	Employees always find time to respond customers	.168	.213	.274	.180	-.067	.728
V24	Knowledgeable employees	.157	-.071	.215	.088	.201	.790
V25	Instill confidence in customers	-.076	.079	.715	.309	.122	.249
V26	Individual attention to customers	.193	.145	.762	-.013	.145	.146
V27	Customers best interests are served	.233	.122	.632	.192	.118	.301

Extraction Method: Principal Component Analysis
 Rotation Method: Varimax with Kaiser Normalization

Results

Twenty seven variables associated with service quality of banking services that were deduced from the extant literature, were coded using 5 point likert scale. The response on these variables reflected the customers' opinions regarding impact of IT on banking services. The principal component factor analysis with VARIMAX rotation was undertaken and a six factors solution was obtained, which explained 63.33% variations in the data items. The final result of the factor analysis has been presented in Table 6 with all the twenty seven variables loaded on the six factors. Naming of the factors had been done on the basis of similarity of the variables that are falling under one factor.

Table 6: Factors of service quality

Factor I: Operational Efficiency	Factor II: Convenience	Factor III: Assurance	Factor IV: Experience- scape	Factor V: Service Setting	Factor VI: Employee Efficiency
Secure transactions	Prompt information	Effective grievance handling	Modern equipments	Improved product mix	Employees find time to respond customers
Reduced cost	Increased comfort	Ensured safety	Willingness of employees service customers	Customized services	Employees have knowle-able to service customers
Seamless transactions	Easy accessibility	Visually appealing material	Dependable services	Improved servicescape	
Quick response	Easy availability	Instill confidence	Availability of employees		
Service right the first time	Fast transactions	Individual attention	Attractive screen layout		
Transaction within committed time		Customers best interests are served			

Following six factors representing the dimensionality of service quality of the banking services had been extracted:

- 1. Operational Efficiency:** signifies optimized work processes to enhance productivity and providing value to the customers.

2. **Convenience:** signifies saving of customers' resources and providing them ease and comfort.
3. **Assurance:** signifies a pledge of support inspiring trust and confidence in customers.
4. **Experiencescape:** signifies the place where customers get experiences through active interaction of system elements.
5. **Service setting:** signifies the composition of the system and the service itself.
6. **Employee Efficiency:** signifies employee productivity with the adequate diffusion of time and knowledge resources.

Table 7: Ranking of the factors explaining the impact of IT on service quality

Average Score	Significance level
4.00- 5.00	Highest
3.00 – 3.99	Moderate
2.00 – 2.99	Slight
1.00 – 1.99	Lowest

After grouping the variables into six components, these components were put into further analysis. In order to find out which factor is the most significant one in explaining the impact of IT, we examined the average scores of these factors. The average scores of the six factors presented in Table 7 show that customers have put every item in the bracket of highest to moderate significance. Significance of every factor is quite high (> than 3.50). In their opinion, every dimension of service quality has significant impact of IT be it is the product or the whole system. The table shows that 'convenience' is the factor that is highly affected by the IT.

Factor	Average score	Rank
Convenience	4.33	1
Service Setting	4.17	2
Operational Efficiency	3.95	3
Experiencescape	3.82	4
Assurance	3.77	5
Employee Efficiency	3.62	6

The items like promptness, increased comfort, easy availability, and easy accessibility are the most apparent benefits of IT based banking services to the customers. On the flip side, 'employee efficiency' in terms of resources (time and knowledge) is least affected by the IT among six factors. The customers still have apprehensions regarding whether employee productivity would be enhanced with the inclusion of IT despite the fact that it would lessen their work burden. If we peep into table 8 and look scores of individual items, 'seamless transactions', 'quick response', and 'moderate equipments' are the items having individually high significance but when these are taken as a group, fall under moderate level.

Discussion

With the diffusion of Internet in banking services, quality of such services has been improved magnificently (Wang and Wang, 2007). However, its impact varies among dimensionality of the service quality. As stated earlier, the research purpose was to gain insight into the bearing of technology on individual dimension of service quality. Six factors were considered and the effects of IT inclusion were compared among these.



Figure 1: Service quality dimensionality

Regarding the service quality dimension of convenience, this is the most prominent benefit of the IT enabled banking that appeals to the customers (Joseph, et al., 1999). With the changing lifestyle, 'Any place service' and 'any time service' are like the bells that jingle to fascinate the customers for electronic banking. With the introduction of Centralized Banking Solution (CBS), IT enables banks to offer a multitude of customer-centric services on a 24x7 basis from a single location, supporting retail and corporate banking activities along with all delivery channels (Ravi, 2007). Other factors like promptness in information and in transaction are also ranked high by the customers. So

customers perceive highest impact of IT on these variables.

Responding to intensive competition, banks have also employed technology to improve their service setting. IT provides a platform for development of sophisticated product offerings as it facilitates better asset – liability management (Shastri, 2005) and advanced market research. Newer and better services are offered through electronic media and these are customized to meet the individual customer requirements. The servicescape, composing of physical ambience of the bank as well as places where banking services are offered like ATMs, are also improved to fascinate the customers.

The economic value of a firm is determined by its ability to trade and absorb IT resources, to align (and embed) them with other resources, to diffuse them in activities and manage the activities in a way that creates a low cost offering and has unique qualities among competitors (Hedman and Kalling, 2001). These activities also have influence on the nature of workflow and work processes, thereby accelerating the speed of work (Malhan, 2004) leading to Operational Efficiency. Moreover, adding accuracy and driving defects out of service operations to become more competitive in the market is a new wave prevalent among major service organizations. Operational Efficiency is a factor which has mixed response among customers. Heavy users of electronic banking strongly believe that IT inclusion improves work processes and these are very secure as well as reduce cost of the banking transactions. While light and non users showed strong negative response on this factor. So, having modern and powerful security systems in place, banks should persuade the potential as well as existing customers through their marketing efforts regarding the security and optimization of their electronic work processes.

Businesses focus increasingly on non-material features of their products such as narratives and images which relate to the customers perception (Samuelson, 2010). Total experience creation involves interplay of objects, machines, and technologies. However, banking is not considered as experience industry but experience creation is a sociomaterial phenomenon that is taking place in banking too. With the introduction of machines to carry out banking transaction, total depersonalization is not sought of. To be regarded as good customer experiences, there is still requirement of active involvement and interaction among customers, employees and machines. Banks should make some efforts to empower their employees to improve the experiencescapes.

The service quality satisfaction is the outcome of resources extended to deliver services

against the expectations of consumers from these services (Purohit and Patardikar, 2007). Regarding the service quality attributes of assurance and employee efficiency in handling these technology enabled products, many organizations face a problem of lack of strategic focus and training of employees for required knowledge and skills. Maintaining public confidence and building trust in the technology based services are also the basic ingredients for effective IT implementation in banking.

Our findings have several managerial implications. As stated earlier, delivering high service quality is crucial to creating value for the customers. Banks are employing technology as a strategic weapon to beat the competition and providing better customer service. For banking services being financial in nature, customers perceive service quality in different way. On one front, for some dimensions they consider IT as facilitators for better services but on other front they perceive IT as a big threat in security terms. Accordingly, banks should prioritize their resources to meet the expectations of the customers and advertise their services in a way to overcome their fear of threats regarding ITeS (Information Technology enabled Services). Our results can guide managers in their efforts to infuse technology in different attributes of banking services that would be widely acceptable by the customers. It would further optimize the banking services quality.

Concluding remarks

Technology has become the lifeline of excellence and efficiency for banking institutions (Thomas, 2004). It has not only ameliorated quality of banking services but also brought effectiveness in banking operations, thereby providing value to the customers. The impact of ICT may be visualized in enhancing the quality of the clearing, payment and settlement systems of the banks. Now the banks have technological driven delivery channels that provide convenience to customers in terms of accessibility and transacting with banks. Technology enabled clearing and settlement systems ensure better quality of internal processes or operations thereby providing quicker services to the customers and other transacting bodies (inter banks and other institutions).

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