Evaluating users' experience of service performance using SERVPERF scale: A case study of some private university libraries in Bangladesh

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The central purpose of this paper is to explore and evaluate users' experience of service performance of four private university libraries in Bangladesh. For primary data collection, the study used a 26-item instrument based on five dimensional modified version of SERVQUAL scale. Respondents indicated their degree of opinions on a 7-point Likert-type scale in the three column format. SERVPERF scale (perceptions scores) was applied to explore the service performance. To evaluate existing service performance, the study develops a Service Performance Matrix (SPM) using SERVPERF scale. Result shows that services of IUB library at a large scale (twenty items) and EWU library at a limited scale (three items) are perceived with better performance. The other service items of these university libraries are seeking immediate improvement, which is equally implied for the whole service items of NSU and BRACU libraries. The SPM method used in this study may acts as a more comprehensive performance assessment tool for the librarians to determine the level of service performance, and to maintain the order of improvement priorities for the service items.

Keywords: Service quality, Service Performance Matrix (SPM), SERVQUAL, SERVPERF, Private university libraries, Bangladesh.

Introduction

Understanding academic libraries requires understanding of higher education issues and needs[1]. Due to an increasingly competitive and dynamic educational environment it was said that[2] higher education is recognized as a service industry, which emphasizes on meeting expectations and needs of students. As Johnson said, it is becoming more aware of the importance of student satisfaction[3]. According to him, focusing on student satisfaction not only enables universities to re-engineer their organizations to adapt to student needs, but also allows them to develop a system for continuously monitoring how effectively they meet or exceed student needs. Universities can best attract and retain quality students through identifying and meeting their needs and expectations. To this end, it is imperative for universities to identify and deliver what is important to students. Turk[4] therefore declared, assessment activities in academic libraries are more imperative today than ever before. ISO 9001 also acknowledged that, to reduce the quality gap, the opinions of the customers have not only to be collected but also understood, and the organizations must act consequently in order to meet the customer needs and

to enhance their satisfaction[5]. In line with this thinking, Bawden, Petuchovaite and Vilar[6] believed that, "the evaluation of library services is a topic, and an activity, of importance in all countries with established library services". Without timely feedback of quality, library systems could deteriorate such that recovery or meeting users' satisfaction is difficult, if not impossible. Therefore, quality assessment efforts on the basis of end-user's viewpoint are treated as one of the major concerns and an integral part of library and information science practitioners.

Earlier studies have shown that in the absence of objective measures, business must rely on consumers' perceptions of service quality to identify their strengths and weaknesses, if they are to devise appropriate improvement strategies[7]. Managers, therefore, require psychometrically sound and useful instrument to measure service quality and customer satisfaction[8]. Corresponding to prior researches, the present study is an initiative to draw a user-centric service performance assessment. The study, therefore, conducted a quantitative survey from four private universities in Bangladesh, viz., North South University, Independent University Bangladesh, East West University and BRAC University. A modified version

of SERVQUAL instrument was used to complete the survey. These universities have a good ranking and reputation among the private universities in Bangladesh. University Grants Commission (UGC), an apex body of all the universities in Bangladesh, is satisfied with their academic activities[9].

Review of literature

Higher education is a dynamic fast growing service industry and every day it is more and more exposed to the globalization processes[10, 11]. The academic library is considered as the 'heart' of that industry and the learning community, which provides a place for students and faculties for doing study and research. Hence, it was recommended that, the better understanding of user's specific needs and to provide appropriate types of services, academic libraries must focus on improving the quality of the services they offer and thereby satisfying their users[12,13]. But the key to delivering high quality service is to continually monitor customer perceptions of service quality, identify causes of service quality shortfalls, and take appropriate actions to improve the quality of service[14]. Moreover, Hernon and Altman stated, "quality is in the eyes of the beholder… If customers say there is quality service, then there is. If they do not, then there is not. It does not matter what an organization believes about its level of service"[15].

The purpose of library and information centre is defined by the needs of users. The success of that service is determined by satisfaction or delight of users. Success will come to an organization that best determines the perceptions, needs, and wants of target markets and satisfies them through the design, communication, pricing and delivery of appropriate and competitively viable offerings. This requires a continual relationship between library and users. To sustain competitive and long-term profitability Gorst et al[16] suggested that, businesses are to devote themselves not only to attracting new customers, but also retaining old customers with a view to a continuing business relationship[17]. But, depending on the differences in organizational objectives, the process of achieving beneficial exchange relationships may differ from organization to organization[18]. He also stated that librarians, who adopt this orientation, create their services from the ground-up based on the perceptions, needs, and wants of the customer. Because the objective is satisfying the customers; there is no presumption of what would be the best. But, the researchers argue that users have not always

been at the centre of the practitioners' professional attention.

Since services are intangible, inseparable, heterogeneous and perishable[19], measuring service quality cannot be achieved objectively[20]. Chen thereby suggested that, business must rely on consumers' perceptions of service quality to identify their strengths and weaknesses, if they are to devise appropriate improvement strategies[7]. Managers, therefore, require psychometrically sound and useful instrument to measure service quality and customer satisfaction[8]. The SERVQUAL scale, a tool for measuring service quality developed by marketing researchers Parasuraman, Zeithaml and Berry[21-25] now are popularly used in a wider context of service industry like baking, hospitals, tourism, etc. and not exception to library and information centres for the last two decades.

Many researchers[25-27] used SERVQUAL scale to develop appropriate instrument for measuring service quality in academic libraries. Beyond the SERVQUAL's applicability in information service sector, Cronin and Taylor[28] questioned the conceptual basis of the SERVQUAL scale. In the use of difference score (i.e. discrepancy between perception and expectation), they found it confusing with service satisfaction. It was also claimed that, utilizing difference scores is neither a reliable nor a valid measurement for operationalizing the service quality construct for an information systems services provider. Given that, they justified the performance-only (*perception*) instrument in place of the gap measurement approach. They accordingly claimed that, performance alone provides better predictive validity than SERVQUAL, which is gap-based. Cronin and Taylor[28] therefore, opined that, expectation components of SERVQUAL model should be discarded and instead performance component alone should be used. They called this performance-only subset instrument "SERVPERF". Consequently, the other studies conducted by a number of researchers at different times[29-31] revealed that, performance alone (SERVPERF scale) can exhibit better reliability and validity than the difference scores of SERVQUAL model.

Objectives of the study

The central purpose of the study is to investigate and evaluate users' experience of service performance from four private university libraries in Bangladesh. It also provides a direction to maintain order improvement priorities for the service items.

Methodology

Research framework and design

The data analyzed for this study comes from four selected private universities, viz., NSU (North South University), IUB (Independent University Bangladesh), EWU (East West University), and BRACU (BRAC University) in Bangladesh. To form the questionnaire items, the study used a modified version of SERVQUAL instrument using five service quality dimensions, e.g., resources, competence, responsiveness, demeanor, and tangibles, as proposed by Andaleeb and Simmonds[32]. The questionnaire includes both the qualitative and quantitative part. The quantitative part was based on five service quality dimensions (Table 1) that includes 26 service items. Respondents were asked to indicate their degree of opinions in the three column format (e.g., desired service expectation, minimum service expectation, and perception of service performance) on a 7-point Likert-type scale ranging from '1'-lowest to '7'-highest.

Two hundred (200) questionnaires were distributed among the students of four private universities (i.e., NSU, IUB, EWU and BRACU) on a random basis from October 2010 through April 2011. A total of 181 (90.5%) questionnaires were completed and returned. The data collected were primarily checked to ensure validity of the responses. Some questionnaires, which were incomplete; and the questionnaires where the service items were marked with same score were not considered for the research. To analyze the surveyed data, the SPSS (Statistical Package for Social Science) was used. As part of purification of the scaled items (as used by Cronbach in 1951)[33] the Item-total-correlations (Alfa if item deleted) was applied to delete the garbage items.

Data analysis and computation

The data analyzed were based on descriptive statistics of users' perception scores. Other statistical measures, e.g., Item-total-correlations (Alpha if item deleted) and Coefficient alpha were also used. The overall service performance was calculated as:

The study develops a Service Performance Matrix (see Table 2) to evaluate the existing service performance of the respective university libraries.

Analysis and findings

Sample profile

Among the 200 distributed questionnaires a total of 181 (90.5%) respondents were replied of which 17 were discarded (Table 3). The remaining 164 valid questionnaires were used for the study. It was found that the majority of respondents were from BRAC University (50, 100%), followed by NSU, IUB. The lowest return rate shows beyond EWU (37, 74%).

Respondents' background

Respondents' demographic information is presented in Table 4. The data on gender distribution indicates

Table 1—The modified SERVQUAL dimensions

Dimension	Statement	No. of items included
Resources	All the reading materials including technological equipment and facilities, availability of up-to-date services and library employees;	7
Competence	Knowledge and ability of library employees to answer all questions dependably and accurately;	5
Responsiveness	Willingness to assist library users and quick service delivery;	5
Demeanor	Behavior and courtesy of employees, and their friendliness to library users;	4
Tangibles	The physical facilities including internal environments, right place of materials, and others;	5

Table 2—Service Performance Matrix (SPM)

Service Performance Index (SPI)		Service Strategy index
SPI Scores ($\bar{x}$)	Service performance zones (Y)	Service strategy implementation zone (Z)
$\bar{x}: >=6.00$	Excellent zone (Y_1)	Maintain service performance as it was (Z_1)
$\bar{x}: >=5.00$ & <6.00	Improvement zone (Y_2)	Maintain service performance strictly (Z_2)
$\bar{x}: >=4.00$ & <5.00	Standard zone (Y_3)	Immediate Improvement of service performance (Z_3)
$\bar{x}: >=3.00$ & <4.00	Problematic zone (Y_4)	Taking prompt action toward recovery of service performance (Z_4)
$\bar{x}: <3.00$	Alarming zone (Y_5)	Developing long-term strategy to cut-off the situation and to survive (Z_5)

Note: $\bar{x}$ = Mean of service experience; Y = Service performance zone; Z = Service strategy implementation zone

Table 3—Frequency distribution of questionnaires

Name of the universities	Distributed	Returned	Rejected	Valid	% of the total responses
North South University (NSU)	50	49	03	46	93.88
Independent University Bangladesh (IUB)	50	45	03	42	93.33
East West University (EWU)	50	37	08	29	78.38
BRAC University (BRACU)	50	50	03	47	94.00
Total	200	181 (90.5%)	17	164	82.00%

Table 4—Respondent's demographic information

Variables	Items	NSU	IUB	EWU	BRACU	N	%	Total
Gender	Male	34	14	25	28	101	61.59	164
	Female	12	28	04	19	63	38.41	(100%)
Nature of library visit	Regular	11	10	11	08	40	24.54	
	Frequent	24	10	03	27	64	39.26	163
	Once in a week	04	03	-	02	23	14.11	(100%)
	Whenever I need	07	19	14	10	50	30.67	

that, male respondents 101 (61.59%) formed the largest group of responses. It also reveals that the largest proportion of students (64, 39.26%) visited the library frequently, which is followed by (50, 30.67%) for 'whenever I need'. Only 24.54% students are visiting library regularly, and majority of them are female.

To discriminate the nature of library visit between male and female students a cross tabulation was employed (Figure 1). Result shows that, female students are more sincere in the regular use of library. Inconsistently, male students are found to have lack of interest in the library use regularly. To examine this variation a Chi-square test was employed.

The Chi-square value ($x^2 = 8.732$, df = 3, $P = 0.033$) at 5% level of significance $P < 0.05$ indicates that, there is a significant difference between male and female students in the nature of library use. This suggests the library authority have to pay more attention to male users and try to make them regular users.

Internal consistency check between variables

To complete the study with a valid instrument, it requires purification of the (performance only) scaled items. An Item-total-correlation (Alpha if item deleted) was therefore employed (see Table 5) to eliminate the garbage items from the scale.

Result shows that, all items met the criteria with alpha value ranging from 0.9678 to 0.9689, which is greater than the necessary value 0.70 as proposed by Nunally and Bernstein[34]. This indicates a good reliability of the selected items. The Coefficient alpha for the twenty six items is estimated at $= 0.97$. This
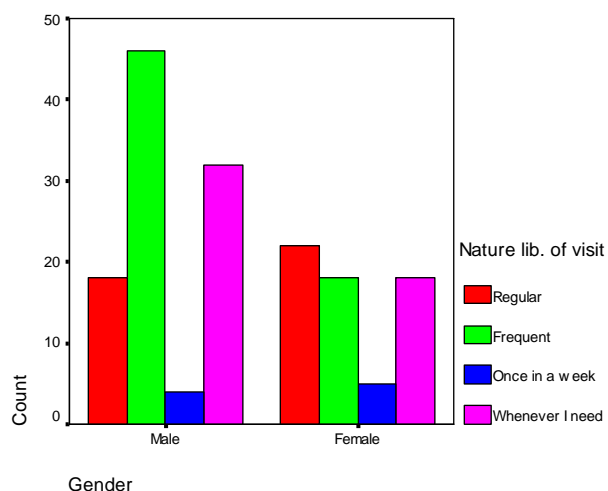

Fig 1—Nature of library visit according to gender

is also quite satisfactory, which suggests the instrument is highly reliable for this study.

User's experience of service performance

The purpose of library and information centre is defined by the needs of users. Success will come to that organization, that best determines the perceptions, needs, and wants of target markets and satisfies them. As Zeithaml, Parasuraman and Berry[14] believed that the key to delivering high quality service is to continually monitor customer perceptions of service quality, identify causes of service quality shortfalls, and take appropriate actions to improve the quality of service. The study, accordingly, investigates users' perceived experiences of service performance, they acquired from their respective

Table 5—Item-total correlation (Alpha if item deleted)

Dimensions with item's code		Service items	Descriptive statistics		Alpha if Item deleted
			Mean ($\bar{x}$)	Std. ( )	
Competence	(Comp-1)	Ability to make quick solution	4.72	0.95	0.9681[*]
Responsiveness	(Resp-2)	Willingness to help users	4.76	1.07	0.9681[*]
Responsiveness	(Resp-3)	Giving personal attention to users	4.66	1.06	0.9684[*]
Responsiveness	(Resp-4)	Giving quick or timely service to users	4.64	1.16	0.9679[*]
Responsiveness	(Resp-5)	Inform users on the regular progress	4.62	0.94	0.9680[*]
Demeanor	(Dem-6)	Courtesy and friendliness of employees	4.75	1.12	0.9682[*]
Demeanor	(Dem-7)	Handling users softly and carefully	4.74	1.06	0.9684[*]
Demeanor	(Dem-8)	Reliable personality	4.68	1.09	0.9681[*]
Demeanor	(Dem-9)	Loving users by heart	4.63	1.08	0.9684[*]
Competence	(Comp-10)	Academic fitness of employees	4.88	1.04	0.9689[*]
Competence	(Comp-11)	Professional skills of employees	4.84	1.05	0.9688[*]
Competence	(Comp-12)	Ability to guide the users properly	4.81	0.99	0.9685[*]
Competence	(Comp-13)	Ability to understand users' problem	4.75	1.02	0.9684[*]
Responsiveness	(Resp-14)	Sincerity of employees on the job	4.80	1.09	0.9685[*]
Resources	(Res-15)	Sufficient number of documents	4.88	0.93	0.9685[*]
Resources	(Res-16)	Updated documents	4.72	0.92	0.9685[*]
Resources	(Res-17)	Informative or resourceful document	4.72	0.94	0.9687[*]
Resources	(Res-18)	Easy access to documents	4.70	1.03	0.9688[*]
Resources	(Res-19)	Latest information services or facilities	4.45	1.10	0.9687[*]
Resources	(Res-20)	E-resources accessibility	4.69	1.10	0.9684[*]
Resources	(Res-21)	Sufficient modern technological tools	4.44	1.10	0.9680[*]
Tangibles	(Tan-22)	Appropriate study environment	4.94	1.10	0.9678[*]
Tangibles	(Tan-23)	Adequate space for study and learning	4.91	0.96	0.9685[*]
Tangibles	(Tan-24)	Documents are at the right place	4.96	1.11	0.9687[*]
Tangibles	(Tan-25)	Users can complaint or suggest easily	4.68	1.09	0.9687[*]
Tangibles	(Tan-26)	Suitable or convenient library hours	4.95	1.09	0.9690[*]

[Note]: Significant at: *$P > 0.70$;   Coefficient alpha: $= 0.97$[*]

university libraries. For ongoing monitoring and reporting over existing service performance of four selected university libraries, users' perception scores were therefore used and examined. Table 6 demonstrates the descriptive statistics of perception scores for twenty six service items of four private university libraries with their ranking.

Result shows that the mean values of entire service items of the respective university libraries have fallen above 4.00. This indicates that users are reasonably experienced with the service performance. Differently the most number of service items for IUB library and a small number of items for EWU library are 5.00 and above which indicates good experience of users on the respective service items.

Regarding individual service items, it is observed that the best experience of NSU library users was found for 'adequate space for study and learning' (4.96), while the lowest experience was shown before

'users can complain and suggest easily' (4.37). For IUB library, 'appropriate study environment' achieved the highest ranking at (5.55) in user's experience, while the lowest perception (4.80) was shown before 'sufficient modern technological tools'. The service item 'suitable and convenient library hours' of EWU achieved the highest ranking at (5.38), while the lowest ranking (4.25) is shown before 'willingness to help users'. Users' highest ranking of BRACU library service is shown as (4.79) for 'documents are at the right place', while the lowest performance ranking is shown before 'latest information services or facilities' at (4.02). Moreover, in terms of overall service performance of each university library, the IUB library achieved the highest ranking at (5.16), followed by NSU library (4.69), and EWU library (4.67). The BRACU library achieved the lowest performance (4.47) among the others.

Table 6—User's experience of service performance with relative ranking

Item's code	NSU			IUB			EWU			BRACU		
	$\bar{x}$		$\bar{x}_1$	$\bar{x}$		$\bar{x}_1$	$\bar{x}$		$\bar{x}_1$	$\bar{x}$		$\bar{x}_1$
Comp-1	4.65	0.48	17	5.10	1.30	14	4.54	1.27	18	4.55	0.62	09
Resp-2	4.74	0.44	11	5.28	1.49	08	4.25	1.46	26	4.64	0.53	05
Resp-3	4.54	0.55	20	5.15	1.46	13	4.59	1.40	16	4.38	0.57	20
Resp-4	4.76	0.43	10	5.21	1.52	10	4.28	1.53	25	4.23	0.70	22
Resp-5	4.52	0.59	21	5.33	1.07	05	4.36	1.13	23	4.23	0.60	23
Dem-6	4.70	0.47	14	5.32	1.40	06	4.68	1.59	12	4.36	0.71	21
Dem-7	4.63	0.49	18	5.50	1.13	02	4.69	1.49	11	4.21	0.66	24
Dem-8	4.70	0.51	15	4.95	1.45	25	4.66	1.61	13	4.43	0.62	16
Dem-9	4.50	0.55	22	5.02	1.42	18	4.52	1.55	19	4.49	0.62	12
Comp-10	4.89	0.40	04	5.17	1.40	12	4.63	1.67	14	4.74	0.44	02
Comp-11	4.83	0.38	05	5.05	1.36	16	4.75	1.69	10	4.72	0.50	03
Comp-12	4.72	0.50	12	5.00	1.34	19	5.14	1.36	02	4.53	0.58	10
Comp-13	4.78	0.42	07	5.00	1.43	20	4.76	1.35	08	4.49	0.66	13
Resp-14	4.78	0.47	08	5.24	1.34	09	4.50	1.71	20	4.62	0.64	08
Res-15	4.93	0.25	02	5.07	1.31	15	4.83	1.37	06	4.68	0.52	04
Res-16	4.78	0.42	09	4.98	1.18	21	4.61	1.34	15	4.48	0.59	15
Res-17	4.70	0.47	16	4.98	1.41	22	4.76	1.12	09	4.51	0.55	11
Res-18	4.50	0.51	23	5.05	1.24	17	4.88	1.63	04	4.49	0.66	14
Res-19	4.43	0.54	25	4.98	1.46	23	4.43	1.53	21	4.02	0.53	26
Res-20	4.63	0.49	19	4.98	1.46	24	4.86	1.62	05	4.40	0.61	18
Res-21	4.50	0.51	24	4.80	1.59	26	4.36	1.45	24	4.11	0.60	25
Tan-22	4.91	0.29	03	5.55	1.37	01	4.57	1.64	17	4.64	0.67	06
Tan-23	4.96	0.47	01	5.50	1.15	03	4.41	1.30	22	4.64	0.57	07
Tan-24	4.80	0.45	06	5.29	1.54	07	5.03	1.66	03	4.79	0.51	01
Tan-25	4.37	0.57	26	5.21	1.41	11	4.83	1.47	07	4.40	0.58	19
Tan-26	4.72	0.50	13	5.48	1.44	04	5.38	1.37	01	4.43	0.54	17
Overall mean:	4.69	0.47	-	5.16	1.37	-	4.67	1.47	-	4.47	0.59	-

Note: $\bar{x}$ = Mean of service experience; $\bar{x}_1$ = Performance ranking of service experience; = Standard deviation

Evaluating user's experience of service performance

For evaluating users' perceived experience, the service performance index (Y), and service strategy index (Z) of twenty six service items are mapped onto the SPM (Figure 2). In SPM method, if an overall index value exceeds or equal the performance score (6.00), such an item falls in the 'excellent zone'; if the value exceeds or equal to 5.00 but less than 6.00, the item falls in the 'improvement zone'; if the value exceeds or equal to 4.00 but less than 5.00, the item falls in the 'standard zone'; if the value exceeds or equal to 3.00 but less than 4.00, the item falls in the 'problematic zone'; and if the value shows less than 3.00, the item falls in the 'alarming zone'. Moreover, to sustain or raise the value of (Y), each of the performance zones corresponds with the adjacent strategic direction demonstrated in (Z) zone. Library authority could take actions as directed in (Z) zone, where and when necessary. To discriminate the level of performance, Table 7 shows the results for all twenty six (26) service items in terms of SPM as described in Figure 2.

As shown in Table 2, the whole service items of NSU (ranging from 4.37 to 4.93), and BRACU (ranging from 4.02 to 4.79) fell in the 'standard zone'. These require the authority to take necessary initiatives for immediate improvement of existing service performance. It was found that, majority of items (20) of IUB library (no. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 18, 22, 23, 24, 25 and 26), and only three items of EWU library (no. 12, 24 and 26) fell in the 'improvement zone'. According to service

		Study area zone (X)					
		NSU ($\bar{x}$: 4.37-4.93)	IUB ($\bar{x}$: 4.80-5.55)	EWU ($\bar{x}$: 4.25-5.38)	BRACU ($\bar{x}$: 4.02-4.79)		Service strategy implementation zone (Z)
Performance zone (Y)	Excellent zone (Y_1 : >= 6.00)	X	X	X	X	Maintain service performance as it was (Z_1)	
	Improvement zone (Y_2 : >= 5.00 & <6.00)	X	Item no. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 18, 22, 23, 24, 25, 26	Item no. 12, 24, 26	X	Maintain service performance strictly (Z_2)	
	(Standard zone) (Y_3 : >= 4.00 & <5.00)	All service items	Item no. 8, 16, 17, 19, 20, 21	Item no. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25	All service items	Immediate Improvement of service performance (Z_3)	
	(Problematic zone) (Y_4 : >= 3.00 & <4.00)	X	X	X	X	Taking prompt action toward recovery of service performance (Z_4)	
	(Alarming zone) (Y_5 : <3.00)	X	X	X	X	Developing long-term strategy to cut-off the situation and to survive (Z_5)	

Fig 2—Service Performance Matrix (SPM) of existing service performance

strategy index (Z- zone) the results suggest that authority should maintain the existing service performance strictly. The other service items of IUB library (no. 8, 16, 17, 19, 20 and 21), and the majority of items of EWU library (no. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 25) fell in the 'standard zone'. These are consistent with NSU and BRACU libraries' service performance, which require immediate improvement of existing performance of the respective items. Unfortunately, no attributes were found in the 'excellent zone'. This indicates that users are not exceptionally experienced with the existing service performance from the respective university libraries. Fortunately, users are found to be totally dissatisfied with any of the service items of the respective

university libraries as no items were fallen into the 'problematic' and 'alarming zone'.

Determining improvement priorities of service items

From the perspective of service quality improvement, the SPM is an excellent method for librarians seeking to determine the best improvement strategies. Because the researchers said it incorporates the service performance index as indicated by (Y), where the level of service performance can be identified; and service strategy index as indicated by (Z), where directions are provided to sustain or raise the existing performance. For determining improvement priorities, Chen et al[35] said if an organization possesses abundant resources, general improvement can be made; and if resources are

Table 7—Results of user's experience based on service performance index

Item's code	NSU		IUB		EWU		BRACU	
	$\overline{x}$	(Y)	$\overline{x}$	(Y)	$\overline{x}$	(Y)	$\overline{x}$	(Y)
Comp-1	4.65	Standard	5.10	Improvement	4.54	Standard	4.55	Standard
Resp-2	4.74	Standard	5.28	Improvement	4.25	Standard	4.64	Standard
Resp-3	4.54	Standard	5.15	Improvement	4.59	Standard	4.38	Standard
Resp-4	4.76	Standard	5.21	Improvement	4.28	Standard	4.23	Standard
Resp-5	4.52	Standard	5.33	Improvement	4.36	Standard	4.23	Standard
Dem-6	4.70	Standard	5.32	Improvement	4.68	Standard	4.36	Standard
Dem-7	4.63	Standard	5.50	Improvement	4.69	Standard	4.21	Standard
Dem-8	4.70	Standard	4.95	Standard	4.66	Standard	4.43	Standard
Dem-9	4.50	Standard	5.02	Improvement	4.52	Standard	4.49	Standard
Comp-10	4.89	Standard	5.17	Improvement	4.63	Standard	4.74	Standard
Comp-11	4.83	Standard	5.05	Improvement	4.75	Standard	4.72	Standard
Comp-12	4.72	Standard	5.00	Improvement	5.14	Improvement	4.53	Standard
Comp-13	4.78	Standard	5.00	Improvement	4.76	Standard	4.49	Standard
Resp-14	4.78	Standard	5.24	Improvement	4.50	Standard	4.62	Standard
Res-15	4.93	Standard	5.07	Improvement	4.83	Standard	4.68	Standard
Res-16	4.78	Standard	4.98	Standard	4.61	Standard	4.48	Standard
Res-17	4.70	Standard	4.98	Standard	4.76	Standard	4.51	Standard
Res-18	4.50	Standard	5.05	Improvement	4.88	Standard	4.49	Standard
Res-19	4.43	Standard	4.98	Standard	4.43	Standard	4.02	Standard
Res-20	4.63	Standard	4.98	Standard	4.86	Standard	4.40	Standard
Res-21	4.50	Standard	4.80	Standard	4.36	Standard	4.11	Standard
Tan-22	4.91	Standard	5.55	Improvement	4.57	Standard	4.64	Standard
Tan-23	4.96	Standard	5.50	Improvement	4.41	Standard	4.64	Standard
Tan-24	4.80	Standard	5.29	Improvement	5.03	Improvement	4.79	Standard
Tan-25	4.37	Standard	5.21	Improvement	4.83	Standard	4.40	Standard
Tan-26	4.72	Standard	5.48	Improvement	5.38	Improvement	4.43	Standard

Note: $\overline{x}$ = Mean of service experience; Y = Service performance zone

limited and only a few items can be improved, some items have to be selected as priorities. Corresponding to this idea, the present study generated a sequence to determine improvement priority of the service items.

In the current research findings it was observed that priority of service improvement may vary from library to library. Because, some libraries may usually demonstrate excellent performance, while some others typically demonstrate less-standard and poor performance. Users with excellent library performance are likely to be satisfied with high quality service, while users of others categories are likely to be satisfied with average quality of service performance. The study therefore calculates the SPI to determine improvement priorities. Corresponding to Chen et al's[17] formula for determining improvement priorities, the study suggests that the smaller the service performance index (SPI), the greater the priorities to improve that quality attribute. For setting

improvement priorities of individual service item, attribute with the lowest ranking position (Table 6) should be given first priority followed by order of arrangement, researchers stated. However, the order of given items for improvement priorities are shown in Table 8.

In the present study, no service items were found within Y_1 (*excellent zone*), Y_4 (*problematic zone*), and Y_5 (*alarming zone*) zones as depicted in SPM (Figure 2). Service attributes of all study areas are confined within standard (Y_3) and improvement (Y_2) zones. Hence, it is asserted that improvement should be started from Y_3 (*standard zone*) zone. Considering the performance ranking as described in Table 6, the order of service items for improvement priorities are arranged according to ascending manner. Result shows that (see Table 8) all items of NSU and BRACU libraries, six items of IUB library, and twenty three items of EWU library require priority for immediate improvement.

Table 8—Order of improvement priorities for the service items

Study areas	Service items with priority order	No. of Items
NSU library	25, 19, 21, 18, 9, 5, 3, 20, 7, 1, 17, 8, 6, 26, 12, 2, 4, 16, 14, 13, 24, 11, 10, 22, 15, 23	26 items
IUB library	21, 8, 20, 19, 17, 16	6 items
EWU library	2, 4, 5, 21, 23, 19, 14, 9, 1, 22, 3, 16, 10, 8, 6, 7, 11, 13, 17, 15, 25, 20, 18	23 items
BRACU library	19, 21, 7, 4, 5, 6, 3, 20, 25, 8, 26, 16, 9,13, 18, 17, 12, 1, 14, 2, 22, 23, 15, 11, 10, 24	26 items

Discussion

The effect of the research findings addresses a deep insight about user-centric performance assessment of four private university libraries in Bangladesh. The study found a significant difference between male and female students in the nature of library use. Female students are found to be more sincere in the regular use of library, while male students are found to have a lack of interest in using the library regularly. This suggests that the library authority should pay more attention to male users and try to make them regular. For evaluating users' experience of service performance and service quality improvement, the study developed a SPM (Service Performance Matrix) method. The SPM consists of three major zones, for instance: '*X*-zone' represents the study areas (i.e. NSU, IUB, EWU, and BRACU); '*Y*-zone' indicates the degree of service performance (i.e. excellent, standard, improvement, problematic, and alarming zone); and 'Z-zone' presents strategic directions adjacent to each of the performance zones.

The effectiveness of service attributes distributed in '*X*-zone' was addressed based on five performance criteria as described in '*Y*-zone'. Implementation of appropriate strategy for service improvement (when and where necessary) for the items falling in the '*X*-zone' was addressed by respective strategic criteria of 'Z-zone'. The items falling in the 'excellent zone' require existing service performance that can be maintained as it appears; items appearing in the 'improvement zone' emphasize that the existing performance should be strictly kept up; and the items falling in 'standard zone' need immediate improvement of service performance. Those service items falling within 'problematic' and 'alarming' zone indicate that the respective items are not fairly acceptable to the users. This indicates the need for taking action towards service recovery and also suggests developing a long-term strategy to overcome the situation if the service items are in the alarming zone.

Results regarding the overall service performance revealed that users of IUB library were found to have better experience with the services delivered to them followed by NSU, EWU and BRACU libraries' users' experiences. From the perspective of effectiveness of service performance, the use of SPM method explores that twenty attributes of IUB library and only three attributes of EWU library were fell in the improvement zone. Other than these, the rest six attributes of IUB library, twenty three attributes of EWU library, and the whole attributes of NSU and BRACU libraries were found within the standard zone. Moreover, with regard to improvement priorities for service items, the effect of SPM uncovered that the first improvement priority for NSU library is relating to "users can complaint or suggest easily" that indicates customer service of this library is not so good; while the lowest priority for "adequate space for study and learning" indicates that size of the study area is relatively sufficient.

For IUB library, the lowest number of service items requires immediate improvement. The first priority was for "sufficient modern technological tools", while the lowest priority related to "e-resources accessibility". The result suggests that service modernization with latest technological developments should be emphasized to improve existing service performance of IUB library. For EWU library, the highest improvement priority was shown for "willingness to help users". This indicates that there is a lack of user-employee relationship that may result in user dissatisfaction toward service encounter. Accordingly "easy access to documents" got the lowest priority for improvement indicating that, users are somewhat happy with the accessibility of required information from their library. For BRACU library, the service item "latest information services or facilities" requires improvement. This indicates users of BRACU library are somewhat deprived from contemporary library services. The lowest improvement priority shown before "Documents are at the right place" indicates the sign of goodness for internal setting of library resources.

Conclusion

Measuring students' perceptions of service quality enables a university to prioritize the important factors

for effective allocation of resources, services and other relevant conveniences. The study emphasizes only perceived service experience from respective user groups rather than on collections and other things that a library possesses. Moreover, the study does not focus the size of discrepancy between users' expectations and performance. These are the major limitations of this study that require supplementary research. The prior service quality models have relied solely on assessments of satisfaction with particular items that causes difficulties for providers in assessing priorities for improvement[7]. Present study addresses this deficiency by introducing a Service Performance Matrix (SPM). The method (SPM) used in this study integrates the performance level of individual service items and appropriate service strategy to be implemented with each item, where and when needed. Librarians may consider this as a method to determine the level of service performance as well as to determine improvement priorities for the service items.

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