An Application of Importance-Performance Analysis (IPA) for Evaluating City Bus Service Quality in Cambodia

Sonita Sum[1], Thanapong Champahom[2], Sajjakaj Jomnonkwao[3], Vatanavongs Ratanavaraha[4*]
School of Transportation Engineering, Institute of Engineering, Suranaree University of Technology, Nakhon Ratchasima 30000, Thailand

* Corresponding author e-mail: *vatanavongs@g.sut.ac.th*
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Abstract

The purpose of this paper is to evaluate the service quality of city bus in Cambodia. In this research, Importance-Performance Analysis (IPA) was applied with the focus on assessing the city bus service quality from the users' viewpoints. In order to evaluate the service quality, the twenty-four items were grouped into five different factors concerning Bus Services, Bus Stop Facilities, Driver Attitude, Vehicle, and Bus Capacity with the use of five-point Likert scale. On a five-point Likert scale, face to face survey was performed to grasp the users' expectations and perceptions on the service quality, resulting from 500 respondents. The IPA, a strategic tool, is composed of four quadrants namely: (1) Concentrate Here; (2) Keep up the Good Work; (3) Low Priority: and (4) Possible Overkill, resulting to identify the attributes of service which need to be improved immediately and the ones which are not essential currently, the ones which are overestimated, and the criterions that are satisfactory. Finally, the graphical results play a critical role for the government authorities/agencies to find out the focus areas for improvement of city bus service quality.

Keywords: importance-performance analysis, service quality, users' expectations, users' perceptions, user Satisfaction, Cambodia

1. Introduction

Phnom Penh, the capital city of Cambodia, is also the largest city in terms of population. In 2018, around 12.15% population resided in the city and this will probably increase to 15.25% by 2030. The city's population growth rate is 3.92% annually (United Nations, 2018). This population increase moving into the urban area, mainly in Phnom Penh capital. It is noticed that the increase of GDP per capita creates the main challenge of urban transport in Cambodia resulting in traffic congestion and traffic accidents that become the most serious issues in the city. To confront this problem, many various modes of public transport have been considered by the government namely Bus Rapid Transit (BRT), Light Rail Transit (LRT), Sky rail, and Tramway (Phun, Pheng, & Yai, 2015). Recently, only the public bus service was introduced firstly in Phnom Penh city.

Public buses were introduced in the capital Phnom Penh in 2001. About two months later, they were scrapped due to their poor performance, lack of interest from the public, and lack of cultural familiarity with the concept. Until 2014, the air-conditioned buses were launched which have run from 5:30 am to 8:30 pm along three main bus routes throughout the city. They are managed by the Phnom Penh Municipal Government and formerly sponsored by the Japanese International Cooperation Agency. The system opened to the public in September 2014 with three main lines, other lines have been gradually added over the next several years, as of 2018, 8 city bus lines run across the city (JICA, 2014). The ability to attract and retain the number of passengers takes a leading role in the public transport system's success and destiny. From this perspective, the quality of service turns into the key significance for improving the level of service quality, resulting in higher satisfaction of the passengers and an increase in the use of the system.

Service quality and customer satisfaction have been concerned by companies progressively in recent decades. It might be helpful for both customers and companies, notably for passengers and transit authorities/agencies. It would therefore be beneficial to attract more users by improving service quality and user satisfaction. In addition, this process also assists to minimize the problems like traffic congestion, air, and noise pollution, parking problems and energy consumptions due to the use of private vehicles would be decreased gradually (Nocera, 2011). In this regard, it is very significant to enhance service quality and user satisfaction.

The enhancement in service quality doesn't mean to focus on only cost-effectiveness, but also to rank which attributes/indicators affecting the quality of service based on the customer viewpoints, resulting in getting better services to attract users/customers. Therefore, one of the major ways to strengthen customer loyalty is keeping the customer delighted/satisfied with the service (Dabestani, Shahin, Saljoughian, & Shirouyehzad, 2016).

According to Davidson (2003), customer satisfaction plays a critical role in business destiny and success. It stems from the fact that customers are approved to be the "judges" of the service, it would logically evaluate service on the basis of customers' expectations and standard that they need. The researchers suggest that in measuring the service quality, it would be useful to take everything that might affect customer satisfaction into consideration (Chou, Liu, Huang, Yih, & Han, 2011). Recently, in order to evaluate the service quality, it is mainstream to quantify the gap between customers' expectation and perception of the service they obtained (Wang, Wang, & Zhao, 2007).

Based on the literature, many techniques have been conducted to measure service quality, one thing of concern with many techniques is that they are not often based on customer evaluation as suggested by (Figini, 2003). This author further suggests that the best methods for quality evaluation is either by asking customers their perception/satisfaction on the quality of service or, by asking and inquiring to know the customer expectation or both.

This research explores the gap between users' expectation and perception by identifying the strengths and weaknesses of the city bus service in Cambodia. The data was collected from the city bus users to rate the satisfaction levels of various aspects namely: Bus Stop Facilities, Bus Services, Driver Attitude, Bus Capacity, and Vehicle (Cafiso, Di Graziano, & Pappalardo, 2013b; De Oña, De Oña, Eboli, & Mazzulla, 2013; Deb & Ahmed, 2018; Goh, Currie, Sarvi, & Logan, 2014; Güner, 2018; Sajjakaj Jomnonkwao & Ratanavaraha, 2016; Nwachukwu, 2014). In addition, IPA technique is used in this research since many of transport company managers suggested (Figler, Sriraj, Welch, & Yavuz, 2011; Foote & Stuart, 1998; Group, 2013; Machado-León, de Oña, Baouni, & de Oña, 2017). This is due to the fact that IPA, the simplified and graphical tool, can provide the perceptive hints for the managers/ authorities to pay attention to the vital attributes of service.

The aim of this research is to recognize the strengths and weaknesses of the city bus service in Cambodia. It is worth noting that there has never been such research before in Cambodia context. The result will further give hint to the authorities/service providers about those aspects of service they must address urgently and the ones which are not very concerned.

2. Literature Review

2.1 Satisfaction

Satisfaction is the output of purchasing act/using the service, arising from the comparison between customers' expectations and perceptions of the actual performance they received. Based on the Disconfirmation Model of Customer Satisfaction, it can be seen that the customer satisfaction is extremely affiliated to confirmation/ disconfirmation of pre-purchase expectations. In other words, customers have their own mainstream in consideration before purchasing/using the service (expectations). After perceiving the actual performance of service, the satisfaction evaluations are made by comparing between their perceptions and what they need/want. According to Freitas (2013), the satisfaction evaluation is marked unfavorable disconfirmation if the expectation is better than actual service, favorable disconfirmation if the expectation is worse than actual service, and ordinary confirmation if the actual service meets the expectation. It is therefore significant to take a level of satisfaction into consideration due to it can point out the strengths, the weakness, and productivity of that service.

2.2 Factors influencing public transit service quality

In recent decades, the quality of transit service has become an interesting topic among scholars. According to the literature, numerous previous studies have been involved thoroughly in determining the factors and contributors to the efficiency of public transport, resulting from the users' point of view on the service quality. The prior related studies which have involved in the measurement of service quality with many various multivariate data analysis techniques are outlined concisely in Table 1 (Bordagaray, dell'Olio, Ibeas, & Cecín, 2014; Cafiso, Di Graziano, & Pappalardo, 2013a; Cafiso et al., 2013b; Carreira, Patrício, Jorge, & Magee, 2014; De Oña et al., 2013; Deb & Ahmed, 2018; Eboli & Mazzulla, 2011; Freitas, 2013; Hu, Zhao, & Wang, 2015; Joewono, Tarigan, & Susilo, 2016; Sajjakaj Jomnonkwao & Ratanavaraha, 2016; S Jomnonkwao, Siridhara, & Ratanavaraha, 2015; Mouwen, 2015; Nwachukwu, 2014; Ratanavaraha, Jomnonkwao, Khampirat, Watthanaklang, & Iamtrakul, 2016; Shaaban & Khalil, 2013; Verbich & El-Geneidy, 2016; Vetrivel Sezhian, Muralidharan, Nambirajan, & Deshmukh, 2014). Based on these aforementioned studies, it has been highlighted that by applying different statistical analysis approaches, there were homogeneous and heterogeneous factors influencing the quality of public transit service. This is related to the fact that customers have the different expectations and perceptions of the service quality because of their society, individuality, and mainstream toward similar service.

As a result, it can be concluded that there are five main factors influencing public transit service quality consisting to Bus Services, Vehicle, Driver Attitude, Bus Stop Facilities, and Bus Capacity. Moreover, Table 1 reveals that Bus Services and Vehicle had the most significant frequency, Driver Attitude was the second highest factors, Bus Stop Facilities and Bus Capacity also related to the service quality.

2.3 Importance-Performance Analysis (IPA)

IPA is a graphical tool used for better understanding about customer satisfaction and identifying the most critical attributes/ items for improvement (Martilla & James, 1977). Based on Frauman and Banks (2011), IPA is composed by two-dimensional graph that the vertical axis represents Customers Satisfaction or Performance and the horizontal axis represents Importance of service, which is broken into four quadrants as shown in Figure 1:

"Concentrate Here" represents the area where items are highly important and where the performance levels are low. It would get the maximum result if the items in this area are improved immediately.

"Keep up the Good Work" denotes the area where items are highly important and where the performance levels are high. The entrepreneurs should maintain recent activities.

"Low Priority" represents the area where items are low important and where the performance levels are low. It means that it is not necessary to improve this area.

"Possible Overkill" denotes the area where performance levels are high, but the items are not defined as important. In this quadrant, the improvement to these items can be minimized.

Table 1. Summary of Factors influencing public transit service quality

Author(s) (Year)	Analysis Method	Factors				
		Bus Services	Bus Stop Facilities	Driver Attitude	Vehicle	Bus Capacity
Deb and Ahmed (2018)	Factor analysis, Linear regression analysis, and SEM	/		/	/	
Sajjakaj Jomnonkwao and Ratanavaraha (2016)	Hierarchical CFA	/		/	/	
Joewono et al. (2016)	SEM	/	/	/	/	
Verbich and El-Geneidy (2016)	Logistic modeling	/	/	/	/	
Ratanavaraha et al. (2016)	MSEM	/		/	/	
Hu et al. (2015)	Factor analysis, SEM, and Multinomial logit modeling	/		/	/	/
Mouwen (2015)	Multiple regression	/	/	/	/	
S Jomnonkwao et al. (2015)	Cluster Analysis	/		/	/	
Nwachukwu (2014)	PCA, Linear regression analysis	/	/		/	/
Vetrivel Sezhian et al. (2014)	Discriminant analysis	/	/	/	/	
Bordagaray et al. (2014)	Ordered probit model	/		/	/	
Carreira et al. (2014)	SEM	/	/	/	/	
Cafiso et al. (2013a)	Kendall's algorithm			/	/	
Cafiso et al. (2013b)	Delphi method			/	/	
Freitas (2013)	IPA	/	/	/	/	
Shaaban and Khalil (2013)	SEM	/	/	/	/	
De Oña et al. (2013)	SEM	/		/	/	/
Eboli and Mazzulla (2011)	Logical and Mathematical	/	/	/	/	

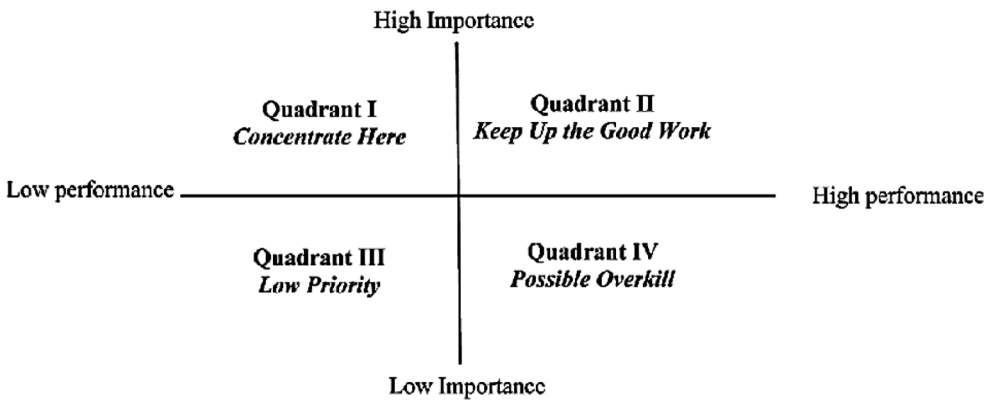

Figure 1. The original IPA framework. (Source: Martilla & James, 1977)

According to the literature, IPA has been broadly applied in various fields such as Tourism (Azzopardi & Nash, 2013; Coghlan, 2012; Cohen, Coleman, & Kangethe, 2016; Dwyer, Cvelbar, Edwards, & Mihalic, 2012; Griffin & Edwards, 2012; H.-S. Lee, 2015; Pan, 2015; Rasoolimanesh, Dahalan, & Jaafar, 2016; Ziegler, Dearden, & Rollins, 2012), Public administration (Van Ryzin & Immerwahr, 2007), Food industry (Jang, Ha, & Silkes, 2009), Healthcare (Abalo, Varela, & Manzano, 2007; Mohebifar, Hasani, Barikani, & Rafiei, 2016), Restaurant (Chen & Chen, 2010), and more interestingly in Public transportation (Freitas, 2013; Shaaban & Khalil, 2013).

3. Methodology

The proposed methodological procedure was composed of two main parts namely i) Questionnaire design and Data collection ii) an application of Importance-Performance Analysis for identifying the attributes of service which need rapid attention and the ones which are not crucial at the moment, the ones which are overstated, and the dimensions that are sufficient.

3.1 Questionnaire design and Data collection

Data was collected through a questionnaire in order to firstly, assess the users' expectations of the service, which is made before getting the service, and secondly, evaluate the users' perceptions of the service, which is made after getting the service. The questionnaire was composed of two main sections consisting of i) Questions concerning users' demographics such as gender, age, education level, average income etc. ii) bus users were asked 24 questions/ items to rate the service quality on the measurement of satisfaction by using a five-point Likert scale from 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = Neither Agree nor Disagree, 4 = Agree, and 5 = strongly agree (De Oña et al., 2013; Hernandez & Monzon, 2016; C.-K. Lee, Yoon, & Lee, 2007). In order to evaluate the service quality, the 24 items were grouped into 5 different factors concerning Bus Services, Bus Stop Facilities, Driver Attitude, Vehicle, and Bus Capacity as indicated in Table 2. Data were gathered in Phnom Penh city by using questionnaire and oral interviews. City bus users (both waiting at bus stops and being on board) were the target population in this study. They would be best able to provide their viewpoints for evaluating the existing city bus services and levels of satisfaction with those services in Phnom Penh. Simple Random Sampling Technique was used as the tool to collect data. Participants who use bus services in the city and were between the ages of 15 and 70 were selected, resulting from 500 respondents.

3.2 Importance-Performance Analysis (IPA)

IPA in this research was used for the evaluation of the attributes to assess the quality of bus service which managed by Phnom Penh Municipal Government. In total, 24 items in the questionnaire were grouped into each of the four Quadrants which were constructed by the two-dimensional graph that on the vertical axis, Users Satisfaction or Performance calculated from the average of General Satisfaction of each attribute and on the horizontal axis, Importance of service calculated from the average of General Important Degree of each attribute as well. As a result, by using the importance and performance of each attribute, IPA can be plotted graphically.

4. Findings

4.1 Sample Characteristic

According to Table 3, it can be observed that most of the respondents were women 67.20% and 32.80% were men. In term of age, it was grouped into ten years interval and it has been found that 149 participants (29.80%) were under the age of 20, 343 (68.60%) were between 20 to 65 years old, and only 8 people (1.60%) who were older than 65 years old. Regarding to education level, it was found that the majority of the respondent was bachelor holders 49.60%, followed by under the bachelor's degree 49.00%, Upper Secondary 40.20%, Diploma 8.80%, Master 1.00%, and Doctor 0.40% respectively. In terms of average income, the sample of respondents was composed of 268 respondents who didn't have the salary or they were studying (53.60%), followed by 101$ - 200$, 201$ - 300$, 301$ - 400$, <= 100$, 401$ - 500$, and 500$ + were in the portion of 16.80%, 15.80%, 5.40%, 3.40%, 2.60%, and 2.40% respectively. Furthermore, there is no tourist to participate in this survey, so 100% of the sample were Cambodian. With regard to the travel experience, 82.00% of passengers has never had this experience, while 18.00% said that they had ever faced a problem of bus breakdown on the way.

4.2 Descriptive statistics

Table 4 illustrates the information about importance and performance of each variable. In regards to Importance, it has been observed that Driver Attitude had the highest mean of importance at 4.220, while the second most important factor was Vehicle at the mean value of 4.163. On top of that, Bus Services was the third most important factor at the mean value of 3.988 and the fourth most important one was Bus Stop Facilities at the mean value of 3.838. Moreover, the lowest mean of

Factor	Variable	Question
Bus Stop Facilities	V1	Bus stops have roofs that provide protection from sunlight and rain.
	V2	Bus stops have enough seats for waiting.
	V3	Bus stops are clean without any dust or garbage.
	V4	Bus stops are durable and strong without any damage.
	V5	Bus stops are sufficiently available in the main buildings.
	V6	The locations of bus stops are appropriate. They are not very far from residences.
	V7	Bus stops have sufficient lighting at night.
	V8	Bus stops are located in safe areas that are not lonely and fearful.
Bus Services	V9	There are enough bus services in rush hours.
	V10	There are enough bus services outside rush hours such as during daytime and evening.
	V11	The buses run punctually according to the bus schedule.
	V12	There are widespread public relationships of bus schedules on the internet/ application.
	V13	There are available of schedule/maps at bus stops.
	V14	Bus routes cover every area.
	V15	Ease of purchasing tickets.
	V16	Timetable is clear and easy to understand.
Driver Attitude	V17	Good personality and appearance of driver and crew that is neat, clean, and meets uniform standards.
	V18	Friendly, helpful and polite customer service of driver and crew.
	V19	Bus driver driving safely, i.e. at a safe speed, politely, with respect for traffic rules.
Bus Capacity	V20	In rush hours, the buses are crowded. There are no available seats.
	V21	Outside rush hours, the buses are crowded. There are no available seats.
Vehicle	V22	Decent appearance of vehicle body.
	V23	The bus floor is clean without any dust or garbage.
	V24	While sitting in the buses, the temperature inside is cool, and it is not stuffy.

Table 2. Factors and Variables of service quality

Socio-demographic Characteristics		Percentages
Gender	Men	32.80
	Women	67.20
Age	10 - 19	29.80
	20 - 29	42.40
	30 - 39	15.80
	40 - 49	5.20
	50 - 59	4.40
	60 - 65	0.80
	65+	1.60
Education level	Upper Secondary	40.20
	Diploma	8.80
	Bachelor	49.60
	Master	1.00
	Doctor	0.40
Average income	None	53.60
	<= 100$	3.40
	101$ - 200$	16.80
	201$ - 300$	15.80
	301$ - 400$	5.40
	401$ - 500$	2.60
	500$ +	2.40
Citizen	Cambodian	100
	Tourist	0
Travel Experience	Yes	18.00
	No	82.00

Table 3. Socio-demographic Characteristics of bus users

importance was Bus Capacity at the mean value of 3.647. In terms of Performance, it has been noted that Driver Attitude also had the highest mean of satisfaction at 4.021, followed by Vehicle, Bus Services, Bus Stop Facilities, and Bus Capacity were at the mean satisfaction of 3.977, 3.548, 3.336, 3.143, and 3.143 respectively. More interestingly, if we take a closer look at table 4, it is worth highlighted that the users considered V24 (While sitting in the buses, the temperature inside is cool, and it is not stuffy), V19 (Bus driver driving safely, i.e. at a safe speed, politely, with respect for traffic rules), V15 (Ease of purchasing tickets), V17 (Good personality and appearance of driver and crew that is neat, clean, and meets uniform standards), and V22 (Decent appearance of vehicle body) as the most important variables/ items that lead them to use the bus service and feel satisfied with it. In addition, V14 (Bus routes cover every area) was the only item that makes users dissatisfied with the current service. Furthermore, the mean average importance of all the 24 items was calculated at 3.960, while the average of mean satisfaction was at 3.556. Therefore, if the importance and performance were plotted on the IPA grid, it would be useful for authorities/ managers to quickly evaluate the areas which need urgent attention and the ones which do not need to focus on.

Table 4. Descriptive statistics of variables/ items

Factor	Variable	N	Importance			Performance		
			Mean	SD	Mean of Factor	Mean	SD	Mean of Factor
Bus Stop Facilities	V1	500	3.984	0.710	3.838	3.608	0.955	3.336
	V2	500	3.870	0.643		3.414	0.906	
	V3	500	3.762	0.659		3.136	0.925	
	V4	500	3.784	0.665		3.430	0.878	
	V5	500	3.790	0.635		3.228	0.933	
	V6	500	3.882	0.633		3.362	0.936	
	V7	500	3.794	0.633		3.132	0.974	
	V8	500	3.834	0.651		3.378	0.881	
Bus Services	V9	500	3.820	0.642	3.988	3.152	0.942	3.548
	V10	500	3.790	0.628		3.412	0.925	
	V11	500	4.048	0.550		3.628	0.878	
	V12	500	3.740	0.691		3.376	0.923	
	V13	500	4.144	0.548		3.936	0.773	
	V14	500	4.018	0.717		2.942	0.976	
	V15	500	4.216	0.637		4.066	0.846	
	V16	500	4.130	0.557		3.872	0.849	
Driver Attitude	V17	500	4.216	0.557	4.220	4.100	0.698	4.021
	V18	500	4.166	0.596		3.906	0.843	
	V19	500	4.278	0.563		4.058	0.795	
Bus Capacity	V20	500	3.634	0.630	3.647	3.168	0.895	3.143
	V21	500	3.660	0.667		3.118	0.900	
Vehicle	V22	500	4.208	0.542	4.163	4.106	0.632	3.977
	V23	500	3.898	0.651		3.632	0.864	
	V24	500	4.382	0.577		4.194	0.821	
Average	3.960			3.556				

4.3 Importance-Performance Analysis (IPA)

The intersection in this IPA grid is constructed by utilizing the mean average of importance at 3.960 and the mean average of performance at 3.556. The variables are plotted on the IPA grid by using their mean values; consequently, the graphical results were illustrated in Figure 2 and briefly summarized in Table 5.

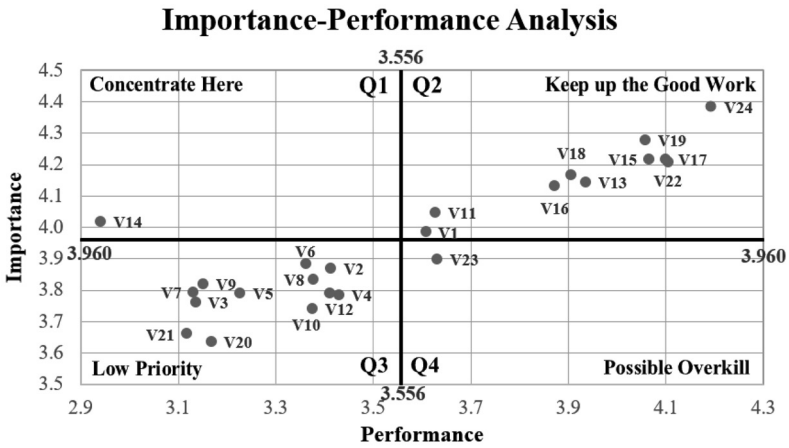

Figure 2. Importance-Performance Analysis Grid

Table 5. Summarized results of IPA

Concentrate Here (Q1)	Keep up the Good Work (Q2)	Low Priority (Q3)	Possible Overkill (Q4)
(V14) Bus routes cover every area.	(V24) While sitting in the buses, the temperature inside is cool, and it is not stuffy	(V6) The locations of bus stops are appropriate. They are not very far from residences	(V23) The bus floor is clean without any dust or garbage
	(V19) Bus driver driving safely, i.e. at a safe speed, politely, with respect for traffic rules	(V2) Bus stops have enough seats for waiting	
	(V17) Good personality and appearance of driver and crew that is neat, clean, and meets uniform standards	(V8) Bus stops are located in safe areas that are not lonely and fearful	
	(V15) Ease of purchasing tickets	(V4) Bus stops are durable and strong without any damage	
	(V22) Decent appearance of vehicle body	(V12) There are widespread public relationships of bus schedules on the internet/application	
	(V18) Friendly, helpful and polite customer service of driver and crew	(V10) There are enough bus services outside rush hours such as during daytime and evening	
	(V13) There are available of schedule/maps at bus stops	(V9) There are enough bus services in rush hours	
	(V16) Timetable is clear and easy to understand	(V5) Bus stops are sufficiently available in the main buildings	
	(V11) The buses run punctually according to the bus schedule	(V7) Bus stops have sufficient lighting at night	
	(V1) Bus stops have roofs that provide protection from sunlight and rain	(V3) Bus stops are clean without any dust or garbage	
		(V21) Outside rush hours, the buses are crowded. There are no available seats	
		(V20) In rush hours, the buses are crowded. There are no available seats	

From Figure 2 and Table 5, it has been observed that only one variable (V14) Bus routes cover every area which falls into quadrant 1, Concentrate Here, which means that the users considered this variable as very important, but the performance level is under an average. Government authorities should prioritize this critical variable for improving the service quality provided. Therefore, it needs an imperative concentration for improvement in this quadrant.

Variables such as (V24), (V19), (V17), (V15), (V22), (V18), (V13), (V16), (V11), and (V1) are positioned in quadrant 2, Keep up the Good Work, which classified by stating high importance and performance level is also high. In addition, the variable which has the highest importance and satisfaction is (V24) While sitting in the buses, the temperature inside is cool, and it is not stuffy. Even though these variables are the strength of the service, the government agencies should keep up the good work in order to make the users satisfied. On the contrary, these variables might take a chance to run into the quadrant 1, for instance, (V1) Bus stops have roofs that provide protection from sunlight and rain and (V11) The buses run punctually according to the bus schedule in this research.

Some of the variables are considered as Low Priority "Low important and the performance levels are also low" and fall directly into quadrant 3 namely: (V6) The locations of bus stops are appropriate. They are not very far from residences, (V2) Bus stops have enough seats for waiting, (V8) Bus stops are located in safe areas that are not lonely and fearful, (V4) Bus stops are durable and strong without any damage, (V12) There are widespread public relationships of bus schedules on the internet/application, (V10) There are enough bus services outside rush hours such as during daytime and evening, (V9) There are enough bus services in rush hours, (V5) Bus stops are sufficiently available in the main buildings, (V7) Bus stops have sufficient lighting at night, (V3) Bus stops are clean without any dust or garbage, (V21) Outside rush hours, the buses are crowded. There are no available seats, and (V20) In rush hours, the buses are crowded. There are no available seats. It is not necessary to improve in this area.

In quadrant 4, Possible Overkill, there is only one variable (V23) The bus floor is clean without any dust or garbage which falls under. The users considered this variable as low importance and the performance levels are high. Thus, the improvement in this area would be ineffective since the users are satisfied with service already.

Furthermore, the strengths and weaknesses of service were investigated by the level of satisfaction. From Figure 2, it has been revealed that there is only one variable which is the weakness of service (V14) Bus routes cover every area. Moreover, the strengths of service consist of; i) Vehicle (V24) While sitting in the buses, the temperature inside is cool, and it is not stuffy and (V22) Decent appearance of vehicle body, ii) Driver Attitude (V17) Good personality and appearance of driver and crew that is neat, clean, and meets uniform standards and (V19) Bus driver driving safely, i.e. at a safe speed, politely, with respect for traffic rules iii) Bus Services (V13) There are available of schedule/maps at bus stops, and iv) Bus Stop Facilities (V1) Bus stops have roofs that provide protection from sunlight and rain.

5. Discussion and Conclusions

Specifying the strengths and weaknesses of the city bus services has made an essential contribution to the government authorities. In this research, face to face survey was made in order to know the users' expectations and perceptions to strategically prioritize the area for improvement, resulting from 500 respondents. The IPA, a strategic tool, was applied and discussed in this research, resulting to provide the government authorities the guideline which rapidly empowers them to comprehend users' demands and desires and to evaluate user satisfaction instead of depending on only performance attributes. Logically, the variables in the Concentrate Here quadrant are considered as the urgent contributors which need urgent attention.

Based on the results of IPA, it has been observed that only one variable "Bus routes cover every area" which is located in the Concentrate Here quadrant. This is due to the fact that all 8 city bus lines are located in the urban area and the lack of bus lines in the suburban area for fulfilling customers' demands. Actually, the population is centralized in the city and there is a lesser population in the suburban area. Running in long and less payable areas would cause to meet a budgetary shortfall in the bus business. Furthermore, there are very long routes in the suburban areas which require more than 200 bus vehicles to fulfill the service with 15-minute headway. There are inadequate city buses to cover the entire both urban and suburban area. In addition to the above mentioned, there are missing road links and poor road infrastructure in suburban areas – including low road density, the preponderance of unpaved roads and roads too narrow to allow traffic to pass safely. For the quadrant which is doing the good work, the variables that are positioned in this

quadrant consisting of "While sitting in the buses, the temperature inside is cool, and it is not stuffy". Moreover, it is also important to pay attention to the variables which are closed to Concentrate Here boundary like Bus Stop Facilities; "Bus stops have roofs that provide protection from sunlight and rain" and Bus Services; "The buses run punctually according to the bus schedule". Variables which are placed in the "Low Priority" quadrant concerning Bus Stop Facilities, Bus Services, and Bus Capacity. However, the variables which are considered as the less important among all the variables are "Outside rush hours, the buses are crowded. There are no available seats" and "In rush hours, the buses are crowded. There are no available seats". According to the users, the variable which is situated in Possible Overkill quadrant is "The bus floor is clean without any dust or garbage". The users are not considered it as important, it is thus not necessary to make an improvement in this quadrant.

After investigating the results, it is worth highlighted that the critical issue concerning the lack of bus routes in every area. It would increase the level of users' satisfaction if the government authorities provide more bus routes even in suburban areas.

To conclude, this IPA is the strategic tool for the government authorities or researchers to evaluate the city bus services quality by providing the guideline to prioritize the focus area for improvement. Even though obtaining the good responses from 500 participants, it would be better for further research to make it more generalized to the entire population.

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