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Research paper

Service Quality and Satisfaction with City Bus Public Transport, Kota Kinabalu Sabah

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Abstract

The urban public transportation is an important network system that many urban residences have come to rely on for accessibility and linkage to key urban areas. Although in many urban centers, private transport services is also a preferred mode of transport for many people, however, the significance of public transport remains a perceived need of the city from the standpoint of efficient and timely link between urban areas, control of traffic congestion, and impact on the urban air quality. For the public to maintain their patronage in public transport, reasonable public satisfaction with the services offered is indispensable. Kota Kinabalu city bus is a government-operated bus company started in 2009, but is gradually loosing public interest with low patronage, resulting in increase in personal vehicle traffic. This study aims to understand the reasons for low user patronage of city bus service by investigating the efficiency and quality of service provided. Both quantitative and qualitative data were collected using questionnaire survey and open ended interview. Data is analyzed using inferential statistics analysis and factor analysis. Findings reveals that majority of the users are female of Malaysia nationality in age group 18-24 years and predominantly from low-income group. Overall users rated satisfaction is low because poor services in key area such as Disabled-friend Facility, Bus Network Coverage, Overcrowding and Vehicle Cleanliness. Comfort and Safety were also a major area of concern. It was evident from the study that the users are willing to pay more for improved quality City but. It can thus be inferred that the users of public bus service are not necessarily looking for cheap services but will appreciate improved services at the reasonable price

Keywords: *Kota Kinabalu; public transport; service quality; statistical analysis, user satisfaction*

1. Introduction

Public transport is a collection and distribution operation that provides people with mobility and affordable access to desired social, professional, commercial, recreational, and other destinations. The public transportation planning aims to address public safety, social needs, economic development, current or future land use, and traffic demand [1]. A well-planned public transport system plays a vital role in the connection of urban and suburban area and ensures to sustain dynamism and decent quality of life [2]. However, there are many obstacles that stand in the way of development of public transport systems. Major challenges in public transportation that leads to un-satisfactory services have been highlighted elsewhere [3]. These challenges arise from failure of system to optimize costs, network, and coverage. Globally, a reformation of public transport systems is going through a transition; from traditional operator-orientated to user-orientated executive system, where the focus is on customer's gratification rather than operator's profit [4].

Malaysia, like most countries operates public transportation in most of its major cities. Under the Malaysia Act 715, public transport is defined as "the transport on land by means of land public passenger and land public freight transport, and includes land public transport services, terminals, facilities, networks, systems, operations, and other services associated with such transport or land public transport services" [5] - [7]. Unfortunately, public transport planning often lacks coherence with the town planning and usually the planning systems are improperly integrated together, since the local planners lack the experience to integrate transportation system into the overall urban planning framework and also not be able to forecast the future demand of transport services [8].

Kota Kinabalu, the capital city of Sabah state, Malaysia, is an example of small urban city that had increasingly depended on private transport system and travel demand is dominated by private vehicles. Kota Kinabalu is undergoing rapid urbanization and population growth that has aggravated the demand of efficient public transport system. The problems affecting current Kota Kinabalu transport system include traffic congestion, traffic-related accidents, prolonged travel time and environment related sundry pollutions. According to [9], efficient public transport system provides solution to such urban transport problems and additionally cost credits to the traffic congestion, fulfilment of mobility requirements and reduced energy consumption.

This study aims to investigate the service quality of Kota Kinabalu city bus public transport provider that was commissioned in 2009. The objectives of the study are to investigate the patronage and to rate the user satisfaction of the city bus service as a measure of the

bus service efficiency. The study also builds on various other studies [10] - [13]. These studies have variously investigated the satisfaction of users to understand the management and usage of public transport in Malaysia.

2. Location of study area and data collection

Kota Kinabalu is the capital city of the state of Sabah, Malaysia. It serves as the primary commercial and industrial centres of East Malaysia. It was designated as a city in the year 2000 and has since then seen accelerated urban and economic growth. Its location in the South China Sea, sprawling beaches, and dense forests has made it a major tourist destination and one of the most significant cities in Malaysia [14]. Kota Kinabalu city (Figure 1) is the most populous city of Sabah with a population of 452,058 and is administratively managed by the Kota Kinabalu City Hall [15]-[16]. The approximate city area is 351 square kilometres and encompasses Telipok and Sepanggar in north, Kepayan and Tanjung Aru in the south. The urban growth of the city has extended it to include parts of the district of Penampang along the southern city border. The blue lines are the reference lines to locate the study area on the map.

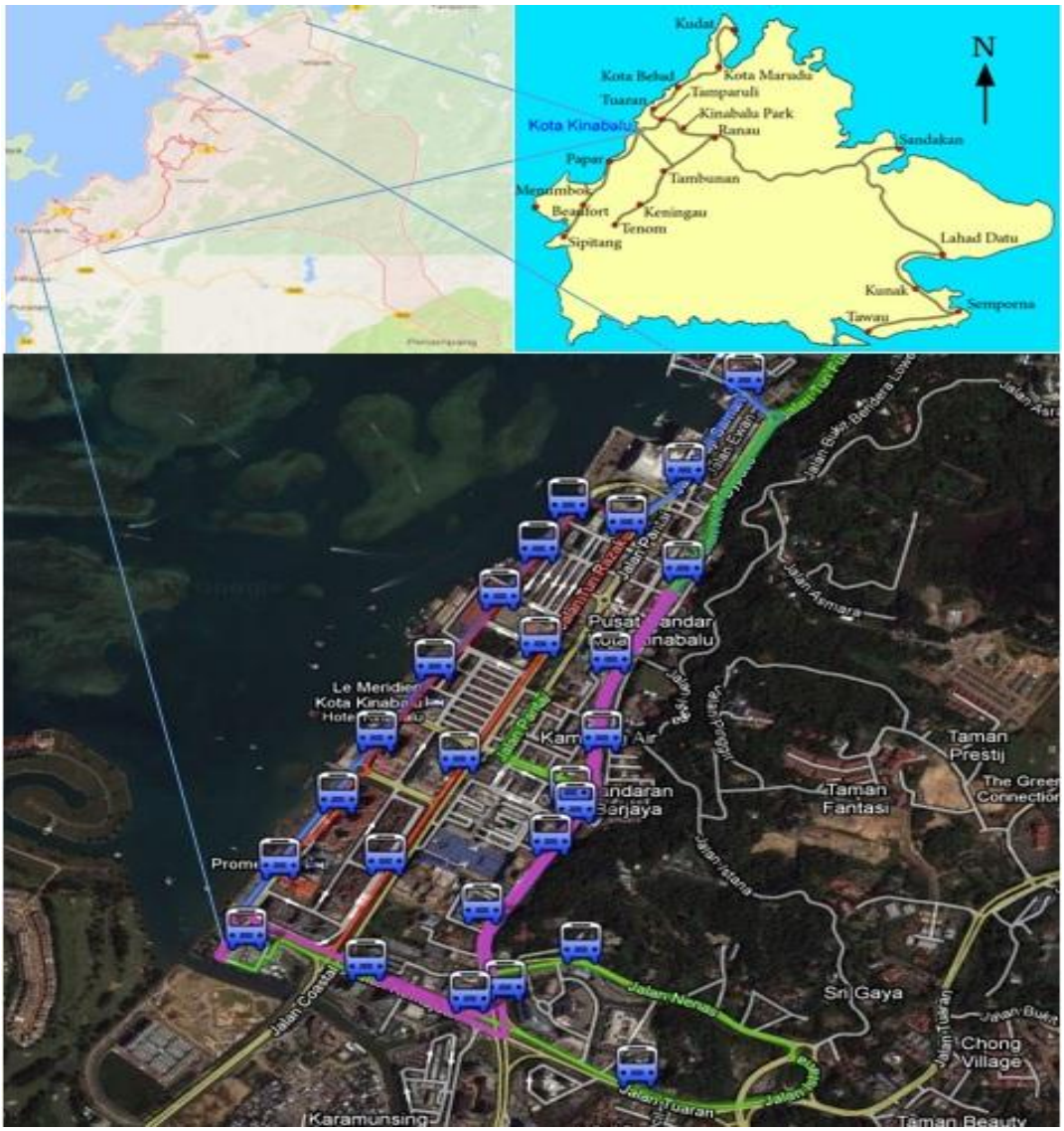

Fig. 1: Map of Kota Kinabalu and layout of city bus route (Source: Google images and Pemandu.gov.my, 2015).

2.1. Questionnaire Survey and Statistical Analysis

A questionnaire was designed and distributed to anonymous respondents so as to ensure un-biased data collection. A pilot study was conducted to examine the efficiency and consistency of the questionnaire outcome. Questionnaires was distributed to random users and also to city bus management to review and validate the questions. All responses were measured based on a five-point Likert-scale ranging from 'very poor' or 'very unsatisfied' to 'very good' or 'very satisfied' [17] - [18]. Questions were standalone and do not interfere with each other. A total of 23 questions were formulated within the following purview:

- The demographic of the users: It included age group, gender, occupation, income range, nationality, level of education and whether or not they own a private vehicle.
- The travel behavior of the users: It included trip frequency, trip purpose, and alternative travel medium.
- The accessibility of the city bus: Respondents were asked about the time taken to reach a city bus station and on the other side time taken to reach their destination after arrival at the desired city bus Station.
- The satisfaction level towards the service quality of city bus: It focused on the various aspects and service attributes of city bus, like vehicle cleanliness, driver's attitude, and punctuality.

- The various opinions upon the possible improvement of city bus and the peak hour usage of city bus.

Participant were sampled based on the following criteria: Volunteers to take part in the survey should have at least used the city bus once and are aged 18 years or above. The on-site survey was conducted on four locations: Station Jesselton Point, Temporary Main Terminal Station Marina Court, Station Gaya Street, and Station Api-api. Respondent were selected based on the random intercept approach. Some questionnaires were also distributed online using Google Forms through social-media and e-mails. The online survey was held continuously for one month starting from 1st March 2017 to 31st March 2017. Data was analysed using IBM SPSS, a popular statistical analysis software [19]. A combination of descriptive and inferential statistics, factor and multivariate analyses were used to interpret and analyse the data [20] - [23].

3. Results and Analysis

A total number of 140 sample questionnaires were distributed; on collection, 30 of them were considered inappropriate as they were partially filled, leaving 110 valid questionnaire responses. Hence, giving a 78.57% response rate for the survey. For ease of analysis, respondents were divided into two categories: the captive user and choice user. Captive users are those who do not own a personal vehicle and their alternative means of travel is rented vehicle or taxi. The Choice users are those who own personal vehicles but by choice travel by city bus. Among the respondents, 56.4% are captive users while only 43.6% are the choice users of the city bus service (Table 1).

Table 1: Vehicle Ownership Summary

Personal Vehicle Ownership	Frequency	Percentage (%)
Yes	48	43.6
No	62	56.4
Total	110	100

3.1. Demographic and economic characteristics of city bus users

The survey shows that female (52.7%) respondents use the city bus more than the male users (47.3%) as shown in Figure 2(a). In general, male users are captive users as is also noted elsewhere [24] - [25].

Similar proportioning is also noted in the current study as 37 out of 52 male users are captive users. Meanwhile, female users generally come into the category of choice users with a total of 56.9%. This reveals that the female users are more likely to use public transport even though they have alternative means to travel to their destinations. Moreover, it is worth noting that even with low rating of "Level of Security" (2.35) the female users are more likely to use city bus. In the survey, the respondents were divided into four age groups: 18 to 24 years, 25 to 40 years, 41 to 61 years, and >61 (Figure 2(b)).

Among the 18-24 age group, 56.9% are captive users and a significant amount of this group members have income lower than RM1000 (Table 2). This statistical trend suggests that the users of young age groups and lower income group are more likely to use city bus, probably due to their low income level and no alternative choice of travel mode.

Table 2: Age Group Against Income Range

Age Group	Income Range (Thousand RM)					Sum
	< 1	1:2.5	2.5: 4.0	4 -5.5	> 5.5	
18-24	44	12	5	1	3	65
25-40	8	9	3	1	0	21
41-60	4	3	6	3	4	20
>61	3	1	0	0	0	4
Sum	59	25	14	5	7	110

To measure the correlation between use of city bus with age-group and income, it is found on account of inconvenience that only 3.6% of members of age-group >61 are using city bus while they are captive users with under RM2500 income level. Since, they mostly live on the outskirts of the city and in the absence of direct connections multiple transits are needed to reach their destination, while the support facilities like elevators and escalators are also not available on transit stations. It has also been pointed out the, unlike the other developed countries, Malaysia does not widely provide special subsidization to the senior citizens [26].

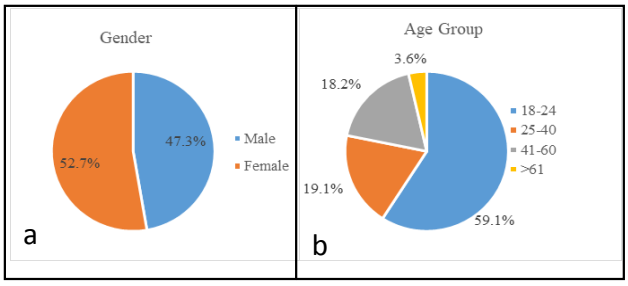

Fig. 2: (a) Gender of city bus users and (b) Age group of users

The analysis also shows that majority of the city bus users are Malaysian nationals (93 in number) making up 84.5% while foreign national (17 in number) only account for 15.5% as shown in Table 3. The 17 foreigners surveyed were all captive users, stating their trip purpose to be mostly leisure and shopping; only few however were for social and working purposes. As mentioned earlier, the commercial hub of Kota Kinabalu is located around the city centre and hence, the bus service routes are mainly along these areas.

Table 3: Trip Purpose by Nationality

Trip Purpose	Nationality		Sum
	Malaysian	Others	
Work	18	7	25
Shopping	34	6	40
Education	8	1	9
Social	31	3	34
Others	2	0	2
Sum	93	17	110

3.2. Occupation and Level of Education of users

The respondents are classified into six occupational groups: private sector, government sector, business, students, unemployed, and retired personal (Table 4). Private sector users (42%), and student users (26%) together are the biggest users followed by business users at 19%. The extensive commercial activities within the central business district (CBD) of Kota Kinabalu supports the findings that private and business sector users make up the biggest portion of the city bus population.

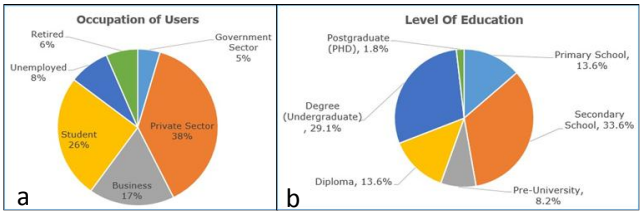

Fig. 3: Proportion of occupation (a) and level of education (b)

Table 4: Occupation Against Income Range

Occupation	Income range (RM1000)					Sum
	< 1	1:2.5	2.5: 4	4 -5.5	> 5.5	
Government	1	1	2	0	1	5
Private	19	12	7	2	2	42
Business	5	7	3	1	3	19
Student	25	1	0	0	0	26

Unemployed	6	2	1	0	0	9
Retired	3	2	1	1	0	7
Sum	59	25	14	5	7	110

Besides, there are many educational institutions located around Kota Kinabalu Town area which explains the student population of 26%. The assessment of the education level of users also shows that most of the city bus users are from secondary and degree levels (Figure 3).

The income level also governs the patronage of city bus, with a general trend of decline in bus use with increase in income. Specifically, the lowest income group are the biggest users (53.6%) while the highest income group clocked lowest use with only 4.5%.

It can thus be concluded that as the city grows economically, income will rise leading to more captive users transitioning into choice users of city bus and hence it only serves as an alternative instead of main transport mode. Similar trend is also reflected in Table 5.

It has also been concluded that Malaysia citizens are always eager to own their personal vehicles and they also enjoy the privilege of driving around and ownership of private vehicle, which is considered an improvement of their social status [27]. It is worth noting that users with income lower than RM1000 were mainly from the private sector and students amounting to 44 out of 59 of the respondents.

From the survey it was obvious that low income citizens are more likely to travel using the city bus system. A summary of relevant cross-tabulation data with the information of captive and choice user with respect to gender, age group, occupation and income range is as shown in Table 5.

Table 5: Summary of Demographics of Respondents

		Total city bus User		Choice User		Captive User	
		Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Gender	Male	52	47.3	15	28.8	37	71.2
	Female	58	52.7	33	56.9	25	43.1
Age Group	18-24	65	59.1	28	43.1	37	56.9
	25-40	21	19.1	9	42.9	12	57.1
	41-60	20	18.2	11	55.0	9	45.0
	>61	4	3.6	0	0.0	4	100.0
Occupation	Government Sector	5	4.5	1	20.0	4	80.0
	Private Sector	42	38.2	18	42.9	24	57.1
	Business	19	17.3	10	52.6	9	47.4
	Student	28	25.5	16	57.1	12	42.9
	Unemployed	9	8.2	2	22.2	7	77.8
	Retired	7	6.4	1	14.3	6	85.7
Income Range (RM 1000)	<RM1.0	59	53.6	17	28.8	42	71.2
	RM1.0 – 2.5	25	22.7	13	52.0	12	48.0
	RM2.5 – 4.0	14	12.7	10	71.4	4	28.6
	RM4.0 – 5.5	5	4.5	3	60.0	2	40.0
	>RM5.5	7	6.4	5	71.4	2	28.6
Nationality	Malaysian	93	84.5	48	51.6	45	48.4
	Others	17	15.5	0	0	17	100

3.3. Evaluation of the Quality of city Bus Service

In an attempt to understand the service quality and satisfaction with city bus public transport, respondents were asked to rate the Service Quality of current city bus and the responses are depicted in Figure 4. Only 11.8% of the respondents voted for "satisfied" with the city bus service while only 7.3% rated "very satisfied".

The descriptive analysis shows the mean satisfaction with service quality of city bus to be 22, which is lower than the average 40 (neutral). This indicates that improvement of the service quality of the city bus is needed. The standard deviation was also found to be 1.158 which implies a consistent rating towards unsatisfied. Table 6 summarises the respondents rating of satisfaction with the bus service.

3.4. Willingness to pay for improved bus service

The survey investigated the willingness for respondents to pay to improve bus service. It is encouraging to note that 70.9% of the respondents were willing to pay for a better service within the range of RM1 to RM2, while 17.3% respondents favoured fares more than RM2. Only 11.8% of respondents preferred service fares to be less than RM1

Table 6: Rating of Quality of City Bus

Rating	Explanation	Frequency	Percentage
1	Very Unsatisfied	23	20.9%
2	Unsatisfied	26	23.6%
3	Neutral	40	36.4%
4	Satisfied	13	11.8%
5	Very Satisfied	8	7.3%
Mean		26.8	
Standard deviation		10.6	

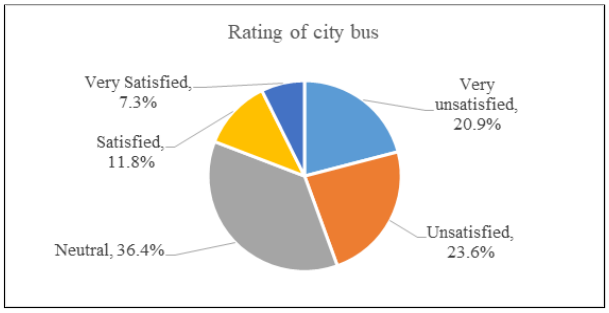

Fig. 4: Levels of satisfaction with city bus service

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This high percentage of willingness suggests that service quality is of utmost importance to city bus users. (Table 7) in case of service improvement, a high percentage of respondents 62.4% affirmed to try to use it as an alternative mode. This finding should encourage the management to improve services even if it requires big investment or results in fare increment.

Table 7: Willingness to Pay More for Better Service

		Will you use city bus if there is improvement?			Sum
		Yes	Try As Alternative Mode	No	
		Agree	Agree	Agree	
Willing to Pay	Yes	23 (27.1%)	53 (62.4%)	9 (10.6%)	85

More For Better Quality?	No	9 (36%)	14 (%^%)	2 (8%)	25
Sum		32	67	11	110

3.5. User rating of quality of city bus service

In terms of service quality, respondents were asked to rate the quality of service based on 12 service attributes: Vehicle Cleanliness, Journey Time, Fare, Punctuality, Reliability, Level of Comfort, Bus Network Coverage, Available Route In-formation, Support Facilities, Level of Security while Waiting at Station, Driver's Attitude, Overcrowding, Value for Mon-ey, and Provision of Disabled-Friendly Facility.

The questions were designed based on a five-point Likert Scale where Rating '1' indicates Very Unsatisfied while Rating '5' indicates Very Satisfied. Table 8 shows the data that were collected and analysed descriptively and interpreted using central tendencies like Mean, Mode, and Standard Deviation. Data was tested for reliability based on Cronbach's Alpha value of more than 0.7.

The analysis, as given in Table 8, shows the mean score ranging from the lowest 2.01 to 3.23 which indicates that most of the respondents are unsatisfied with the service attributes of city bus. Further analysis again shows that the top four service attributes are: *Fair Price, Driver's Attitude, Value For Money, and Journey Time* with mean ratings of 3.23, 2.87, 2.85 and 2.68 respectively. These service attributes have a mode value of 3 (Neutral), which suggests that respondents agree with the overall perceived services. The good rating of 'Journey Time' was also expected as the city bus operates only within the Kota Kinabalu City Centre and thus no extensive journey time was needed.

Table 8: Summary of Rating of Service Attributes

Service Attributes	Mode	Mean Value	Standard Deviation
Fare	3	3.23	1.089
Driver's Attitude	3	2.87	0.949
Value For Money	3	2.85	0.994
Journey Time	3	2.68	0.976
Punctuality and Reliability	2	2.60	1.110
Route Information and Support Facilities	3	2.53	1.047
Level of Comfort	2	2.41	1.103
Level of Security	1	2.35	1.162
Vehicle Cleanliness	2	2.30	0.973
Overcrowding	2	2.20	1.012
Bus Network Coverage	2	2.15	0.897
Disabled-friendly facility	2	2.01	0.883

Mode: 1=Very Unsatisfied, 2=Unsatisfied, 3=Neutral, 4=Satisfied, =Very Satisfied

The survey also showed that the top service attributes that need improvement include the *Disabled-Friendly Facility* and *Bus Network Coverage*. Some reasons that may be attributed to the low rating could be the termination of city bus route that operated into the neighbourhood, which has affected the network coverage of the bus service. Low rating of *Vehicle Cleanliness* could be associated with the location of one of the bus stations nearby the Fish and Vegetable Market, where passengers sometime carry fish into the bus. The *Overcrowding* of the bus can be directly related to the low frequency of city bus service even at high peak hours. This overcrowding issue has also been observed by other researchers [14]. They agreed that the overcrowding is the major problem faced by the Kota Kinabalu Public Bus Transport which includes city bus, local bus and minibus modes.

4. Conclusion

In the study, Kota Kinabalu city bus service quality has been analysed in terms of user perspectives and measures the user perception of satisfaction. It also identified parameters necessary to address to increase the patronage of the city bus service. The results show an immediate need to improve the overall service quality especially Disabled-friend Facility, Bus Net-work Coverage, Overcrowding and Vehicle Cleanliness. Additional factors for attracting users include Comfort and Safety. The city bus service shows great development potential as the users are willing to pay more for better service and mostly responded to commence or increase usage of the bus service, if improvements are made.

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