



PROGRAM AND ABSTRACTS



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“Smart Constructions Toward Global Challenges”



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Shuttle bus services quality assessment Tangerang Selatan toward smart city

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Shuttle Bus Services Quality Assessment Tangerang Selatan toward Smart City

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Abstract. Around the world, shuttle bus operation played the significant role to accommodate transportation for commuting bus passengers. Shuttle Bus services in cities are provided by various bus agencies with kinds of own specific purposes. For instance, at Tangerang Selatan, Indonesia, it was said that shuttle bus In Trans Bintaro is run and operated by private bus companies hire by Bintaro developer. The aim of this research is to identify factors of satisfaction of shuttle bus service in Kota Tangerang Selatan, Indonesia. Several factors are used to analyze sums of 20 parameters performance indicators of Shuttle Bus. A face to face interview using a questionnaire (N=200) was used to collect data on October and March 2017. Likert and diagram Cartesian were used to model the all the parameters. This research succeeded in finding some categories of Shuttle bus service attributes such as accessibility, comfort, and safety. Users agreed that eight indicators in shuttle bus have the excellent achievement, while three indicators on performance remain low and should receive more attention especially punctuality of the bus.

INTRODUCTION

Could you define what a smart city? for some cities, that might be the improved of facilities such as public safety, education or better transportation system and in another word smart city is one that focused on continual improvement. Services quality are important in measuring for public transportation services in Indonesia. The service quality reflects the decision of potential passengers whether they used the shuttle bus services or not. It is important to evaluate the passenger's perception of the shuttle bus service in order to find passengers satisfaction in terms of comfort, availability, and safety. Low quality of service results in inconvenience for users, thus reduces the service competitiveness against private vehicle use. In the year 2008, Tangerang Selatan was established as one of the cities in Banten province, by that time Tangerang Selatan has risen as one of the cities with high development. In this city grew many residential areas with kind of its facilities such as the mall, park, school, and shuttle bus to accommodate people in traveling. Tangerang Selatan has more than 3 shuttle bus system spread in difference residences/zone namely Serpong Alam Sutera, Gading Serpong Summarecon, Serpong BSD and Bintaro area.

This research is focusing on continual improvement in one are which is Bintaro area. Shuttle bus in Bintaro established on 2014, and the population of the ridership in 2016 is 200-280 people per day. The needs for evaluation of shuttle bus services in increasing the activity are important to attract an urban population. It is said that the increased activity of the population will increase the demanding in using public transport and the impact on the level of public transport services (Garling et al. 2002). Sezhan (2011) said the public transport service is a measurement. The analysis and evaluation of the performance are the strategies in improving the service quality of transportation systems, strategies in improving the performance of bus services and provide optimal results in operation are requiring a revamping transportation system based on the characteristics of bus transport services (Adris.A.Putra et al. 2014). This paper reviews the shuttle bus services in Kota Tangerang Selatan focusing on Bintaro area by gathering information about the service operations, and the passenger's perception using questionnaire survey method.

LITERATURE

Study on various topics of service performance has been carrying out globally. The purpose of these studies is for quality improvements in public transport, so passenger's satisfaction can be achieved. Some models were introduced and suggested to analyze shuttle buses reliability performance, such as quality of service and passenger's perception (Yaqub N & Madzlan Napiah, 2011) and effects of shuttle service (Steve Lawson et.al, 2011).

The public transportation service, in this case, shuttle bus is important in improving the quality of service and reduce various problems in public transportation systems. It is stated that to improve the public transportation service performance in urban areas is needs public transport passenger preferences in order to accommodate the requirement. Assessment on public transportation services performance is essential in providing satisfaction to the users of public transportation (Beirao and Cabral 2007).

Scheuning (2004) said that quality of service on public transportation is the requirement or the fulfillment of the expectations that compares the results with the need, the expectations to compare whether to accept a level of quality service. And It is said that public transportation user satisfaction was related to the perceived quality of service, public transportation users feel the quality of service, because every person tends to have a different assessment of public transportation quality, and they will continue in using public transportation if they feel satisfy (Olsen 2007).

Meyer (2002) stated that services performance of the transportation system, the passenger's satisfaction indicators affected by the reliability of the public transportation system, speed, travel time, delays, security, and travel expenses. And also they state that satisfaction on services is the indicators that affect convenience, travel time and reliability, these indicators give impact on customer satisfaction (Cavana and Corbett, 2007).

Furthermore, there are three main things to note on passengers dissatisfaction in public transportation system which is: accessibility, cost and station stops (Andreassen and Lindestad, 1998).

The indicators to give you the satisfaction of users of public transport are the provision of public transportation and a range of public transportation services. In addition, the indicator such as waiting time and comfort is the most significant indicator that affects the transport user satisfaction in general (Trynopoulos and Antoniou,2008).

Based on the description of public transportation performance satisfaction evaluation,it is said that public transport is expected to provide a strategy for improving the performance of transit-oriented towards satisfaction of urban public transport users and at the end public transportation should be able to deliver high performance, in order to give satisfaction to the passengers of public transportation.

The indicator used to evaluate and assess the performance of public transport services is in this case Shuttle bus is based on Bus Passenger Survey indicators conducted by Passenger Focus in 2014 and indicators issued by the Minister of Transportation Regulation No. 46 2014.

The main indicators used are as follows:

- Waiting Time & Travel time
- Bus Stop consists of The information provided at the stop, freedom from litter, the location of the stop is quite representative
- Bus conditions such as bus cleanliness, seat availability, hand railing availability for standing, The cleanliness outside of the bus, exterior condition of the bus, The cleanliness and condition inside the bus, Information that provided inside the bus, The availability of seating or space to stand, The temperature inside the bus.

METHODS

The research method is the descriptive quantitative method, it is used to describe the perception of an individual, or the symptoms of the particular group, or influence in public relations. The rating scales on this questionnaire is using the likert scale and to evaluate the shuttle bus performance and customer satisfaction level translated into the Cartesian diagram.

Cartesian diagram used to divide all indicators into four quadrants, which is the top priority in quadrant I, quadrant II keep achievement in quadrant II, redundant in quadrant III, and quadrant IV in low priority. This quadrant shows in Fig. 1.

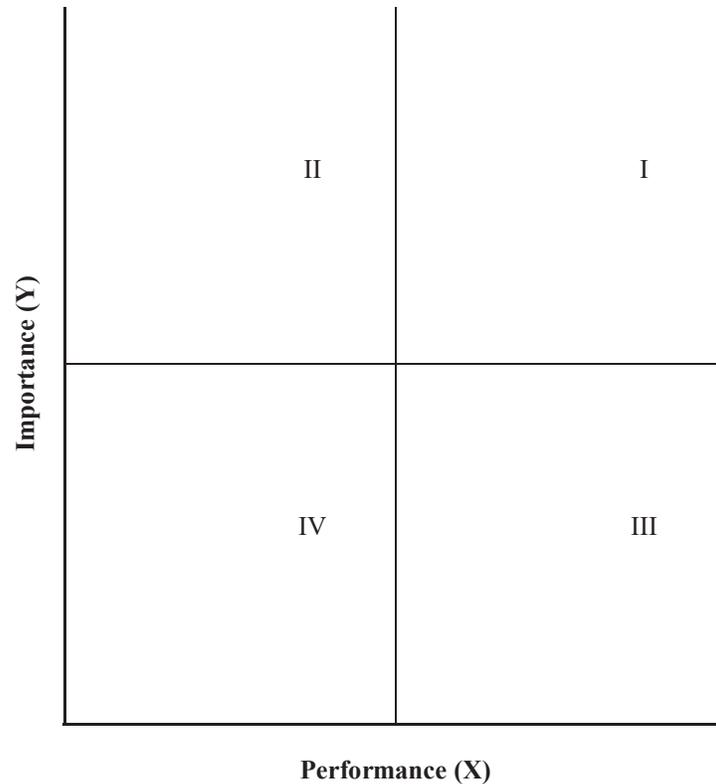


FIGURE 1. Diagram Cartesian

Data about shuttle bus services in Bintaro Area is gathered during a survey in the visiting shuttle bus transit area. The schedules and announcement are observed and taken note. The interviewer is taken from the drivers, by using all information, the service performance can be identified. A survey using questionnaire is conducted to determine the shuttle bus passenger’s demography. It is important to use questionnaire survey to understand their passenger in order to increase quality service that raises the passenger’s satisfaction and decision to keep using the service. Totally 250 questionnaires are given out, but only 200 respondents are collected over period of two (2) months of October and March 2016/2017.

DATA ANALYSIS

Description of Survey Respondents

In total, 200 ridership responded to the survey in four days. This figure represents around 80% of shuttle total ridership everyday day. The sample of the passenger from whom survey responses were collected represents a well-balanced sample that includes representatives from various categories in which shuttle bus ridership could be categorized.

These categories include gender, ridership aged and ridership occupation. Pertaining to gender, 45% of respondents were female while 55% were male. In the ridership aged category, the highest percentage of respondents was aged 21 to 30 at 37%. They were followed by aged under 20 at 35%, aged 31-41 at 15% and aged over 60 at 3% Fig. 2 shows the ridership aged distribution of the survey respondents.

The ridership classification groups of the civil servant, the private employee, police/army, entrepreneur, professional and others represented significantly fewer proportions of the survey respondent population at 4%, 39%, 1%, 4%, 3% and 49% respectively as shown in Fig. 3.

Ridership Aged

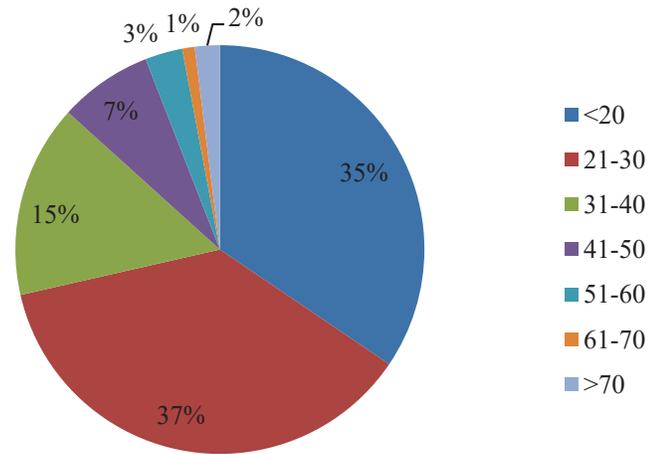


FIGURE 2. Ridership aged

Occupations

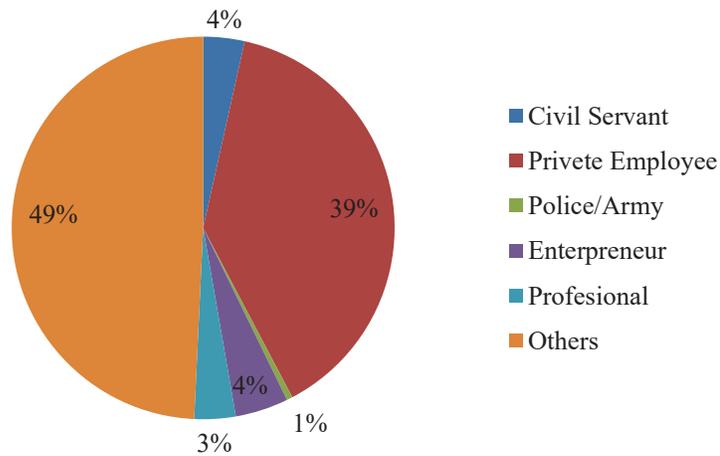


FIGURE 3. Ridership occupations

Shuttle Performance Assessment

Where data was available, shuttle service performance was assessed in 3 areas spread with 20 indicators: punctuality & time waiting for the bus, the bus stop, and on the bus condition performance. The results from the calculation shown in Table 1.

Table 1 describe all indicators in spread into four quadrants with divide is the average rate of performance and interest, the average interest rate of shuttle bus is 3.05/4 and the average performance is 3.24/4. Assessment the level of performance and interest will bring different perspectives according to what is perceived, Cartesian diagram used to portray the intersection of quadrant and the average value of the performance rate and interest of shuttle bus services

with the purpose to find out the specifics of each indicator is located on the quadrant in the Cartesian diagram. Cartesian quadrant position indicators can be shown in Fig. 4.

TABLE 1. Position indicators

Indicator	Average Performance (X)	Average Performance (Y)
The information provided the stop	3.01	3.21
Route/destination information on the inside of the bus	2.97	3.09
The cleanliness and conduction of the inside of the bus	3.30	3.40
The cleanliness and conduction of the outside of the bus	3.19	3.27
The ease of getting onto and off the bus	3.15	3.28
Punctually of the bus	2.76	3.29
Time journey on the bus took	2.84	3.22
The availability of seating	3.08	3.21
The availability of space to stand	3.09	3.17
The comfort of the seats	3.13	3.18
Provision of grab rails to stand/move within the bus	3.00	3.11
The amount of personal space you had around you	3.15	3.28
The temperature inside the bus	3.17	3.31
Your personal security whilst on the bus	3.18	3.28
The helpfulness and attitude of the driver	3.07	3.29
Safety of the driving (i.e. Speed, driver concentrating)	3.17	3.34
How near to the kreb the driver stopped	2.93	3.17
It's condition/standard of maintenance	2.91	3.23
Bus location position	2.99	3.24
Overall satisfaction with the bus stop	3.01	3.31

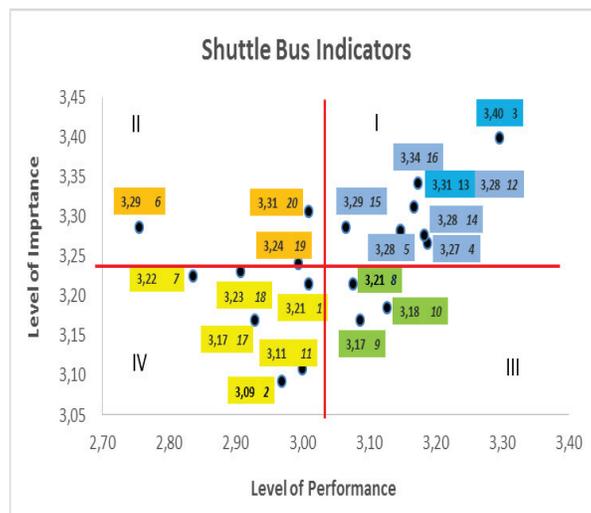


FIGURE. 4. Shuttle bus indicators performance

Fig. 4 presents the location of each indicator, the indicators are described as follows:

- Quadrant I, Indicators that located in this quadrant describe high interest and high performance it is mean this indicators has given satisfaction and must be maintain the achievement. The indicators must be maintained because it has attracted the attention of users to utilize shuttle bus. There are eight indicators that can be maintained, which are:
 - The cleanliness and condition interior of the bus as shown in Fig. 5 (a).
 - The cleanliness and condition exterior of the bus as shown in Fig. 5 (b).
 - The ease of getting onto and off the bus
 - The amount of personal space you had around you

- The temperature inside the bus
- The security whilst on the bus
- The helpfulness and the attitude of the driver
- Safety of the driving (i.e. speed, driver concentrating)



(a)

(b)

FIGURE 5. (a) Interior of the bus condition (b) exterior of the bus condition

- Quadrant II, the indicator located in this quadrant is considered as the main priority which is high expectations but low performance, the indicator is important by the passengers but it has not been in line with the expectations. There are 3 indicators should receive more attention to rising up the performance, there are:
 - Punctuality of the bus
 - Bus stop location position, as shown in Fig. 6.
 - Overall satisfaction with the bus stop



FIGURE 6. Bus stop location

- Quadrant III, high performance and low expectations, the indicator in this quadrant is considered less important by the passenger but it is quite satisfactory. Three indicators included in this quadrant are:
 - The availability of seating
 - The availability of space to stand
 - The comfort of the seats
- Quadrant IV, low priority (low expectations and low performance). The indicator in this quadrant considered less important. The indicators in this quadrant are easy and efficient. The rise of this indicator could be reconsidered. Six indicators included in this quadrant are:
 - The information provided at the stop

- Route/destination information on the outside of the bus
- Time journey on the bus took
- Provision of grab rails to stand/move within the bus, as shown in Fig. 7
- How near to the kerb the driver stopped
- Its condition/standard of maintenance



FIGURE 7. Provision of grab rails to stand/move within the bus

CONCLUSION

Eight indicators in shuttle bus have the excellent achievement, while three indicators on performance remain low and should receive more attention especially punctuality of the bus. And there still three indicators high performance but low expectations. And finally, six indicators should need attention because of them. Have low expectations and low performance. To summarize this paper there still need some improvement in several indicators, only less than 60% are in good performance.

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