STUDENTS PERCEPTIONS
ON TARUMANAGARA UNIVERSITY PARKING SERVICES
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Abstract

One of services provided to university students is parking service. As Tarumanagara University has no dormitory, students live in sorrounding boarding houses or live remotely with their parents. Public transport in Jakarta is far from satisfactory. Therefore the use of private vehicles by students for home-campus vv trips are common. One of the conseuqences would be the need for parking services for private vehicles. In this paper students perceptions on several aspects of Tarumanagara University parking services were collected and analyzed. 100 motorcycle and 100 car users were asked to fill questionnaires. Each questionnaire consists of questions in parking capacity, entry gate services, exit gate services, parking scouting, parking safety, parking fee and parking building design. Partial Least Square-Path Modelling freeware called Smart-PLS was used for analysis. Valid indicators expressing car and motorcycle parking services constructs were in general the same for parking capatity, exit gate services and parking safety/ security.

Key Words: student perceptions, university parking services, Partial Least Square-Path Modelling

INTRODUCTION

One of services provided to university students is car and motorcycle parking services. As Tarumanagara University has no student dormitories, students live in sorrounding boarding houses or live remotely with their parents in Jakarta or even Greater Jakarta. Public transport in Jakarta and Greater Jakarta is far from satisfactory. Therefore the use of private vehicles by students for home-campus vice versa trips are quite significant. This is similar with what happened in Petra Christian University in Surabaya, East Java in which 74.2% of the students used private vehicles most of them (98.5%) were motorized vehicles (Setiawan, 2011). One of the conseuqences would be the need for parking services for private cars and private motorcycles. In this paper students perceptions on several aspects of Tarumanagara University parking services were discussed.

PREVIOUS STUDIES

Chalermpong and Ampansirarat (2011) stated five most parking attributes in their research ini Chulalangkorn University campus parking in Bangkok Thailand, i.e. parking tariff, availability of the parking space, distance to destination, level of security of the facility, the level of protection from sun and rain. As campus activities have different characteristics in terms of peak hours, vehicle composition, fare sensitivity etc with other activities such as Light Rail Train (LRT) station (Ng and Ma'soem, 2005), mixed-use development (Nepal

and Nedumpallile, 2011), airport (Dayana et al, 2012), central business district (Voith, 1998), hotel (Miro, 2009), research in this area should be carried out.

OBJECTIVE

The Objective of this study is to identify indicators valid to express university parking services constructs.

METHODOLOGY

Methodology of Data Collection

Tarumanagara University consists of 4 campuses. Campus 1 and Campus 2 are in West Jakarta. Campus 3 is in South Jakarta and Campus 4 is ini Karawaci, Tangerang (Greater Jakarta). Only Campus 1 dan Campus 2 are in operation at the moment. The respondents were Tarumanagara University students who use the campus 1 parking facilities daily.

There were 100 motorcycle parking users respondents and 100 car parking users respondents. Most of them were interviewed directly, but some of them were asked by e-mail to fill online quesionnaires. The questionnaire was consists of 7 constructs. Each construct was expressed by several indicators (Table 1).

Table 1 Structure of the Questionnaire

No.	Constructs	Indicators
1.	Parking capacity	Number of parking spaces
		Availability of parking spaces on peak hours
		Time to find empty parking space on peak hours
2.	Entrance gate services	Service time
		Queue length
		Out of service incident
3.	Exit gate services	Service time
		Queue length
		Out of service incident
4.	Parking scouting	Scouting during finding parking space
		Scouting during parking
5.	Parking safety and security	Vehicle and consumer belongings security
		Consumer saftey from criminal offends
6.	Parking tariff	Parking tariff rate
		Parking tariff category
7a.	Parking building design (motorcycle)	Ventilation of parking buildings
		Ramp design
7b.	Parking building design (car)	Ventilation of parking buildings
		Turning radius of the ramp
		Droping zone availibility
		90º parking space
		Parking space width
		Car circulation

The questionnaire was then tested for its validity and reliability in a pilot survey involving 10 car users and 10 motorcycle users. In brief, based on the pilot survey the following decisions were made:

- Remove time to find empty parking space on peak hours indicator from parking capacity construct.
- Remove parking scouting and parking tariff constructs from the questionnaire.

After 200 respondents have been interviewed in the main survey, further validity and reliability tests were conducted and in brief the following decision were made:

- Remove entrance gate services construct from car structural model of Partial Least Square-Path Modelling.
- Remove parking buliding design construct from motorcycle structural model of Partial Least Square-Path Modelling.

Methodology of Data Analysis

First of all the data was summarized by descriptive statistics to understand the overall trend of 200 x 16 reponds from the questionnaires. Afterward a Partial Least Square-Path Modelling (PLS-PM) using a freeware available from internet called Smart-PLS was conducted. A structural model was set up for each type of vehicle (car and motorcycle). After running the Smart-PLS only indicators with standardized loading factor at least 0.5 will be considered as valid indicators.

DESCIPTIVE STATISTICS

Table 2 summarize the descriptive statistics of each indicator (minimum value, mean and maxiumum value. As a Likert scale of 1 to 4 was use, the possible values of each indicator were 1, 2, 3 and 4. The highest the value the better the perception of the parking services.

Table 2 Summary of Descriptive Statistics of Indicators

No.	Indicators	Minimum Value	Mean Value	Maximum Value
1	Number of parking spaces	1	1.64	3
2	Availability of parking spaces on peak hours	1	1.23	3
3	Service time (entrance)	2	2.90	4
4	Queue length (entrance)	1	2.76	4
5	Out of service incident (entrance)	1	2.57	4
6	Service time (exit)	1	2.76	4
7	Queue length (exit)	1	2.58	4
8	Out of service incident (exit)	1	2.49	3
9	Vehicle and consumer belongings security	1	2.73	4
10	Consumer saftey from criminal offends	1	2.86	4
11	Ventilation of parking buildings (car)	1	2.82	4
12	Turning radius of the ramp (car)	1	1.99	3
13	Droping zone availibility (car)	1	3.27	4
14	90° parking space (car)	1	2.57	4
15	Parking space width (car)	1	2.62	3
16	Car circulation (car)	1	2.23	4

It can be seen that except for number of parking space, availability of parking spaces on peak hours, out of service incidence at exit, turning radius of the ramp and car circulation, most indicators were higher than 2.50 which intiutively can be used as a cutting point to seperate unsatisfactory and satisfactory perception.

THE MODEL

Figure 1 shows the full model for the motorcycle user perception on constructs related to Tarumanagara University parking services. This also become the final model for the motorcycle user as all indicators standardized loading factors have been at least 0.5 (valid). Figure 2 shows the full model for the car user perception on constructs related to Tarumanagara University parking services. As some indicators still have standardized loading factors below 0.5, those indicators should be removed from the model. Afterward Smart-PLS were rerun and the final model is shown in Figure 3.
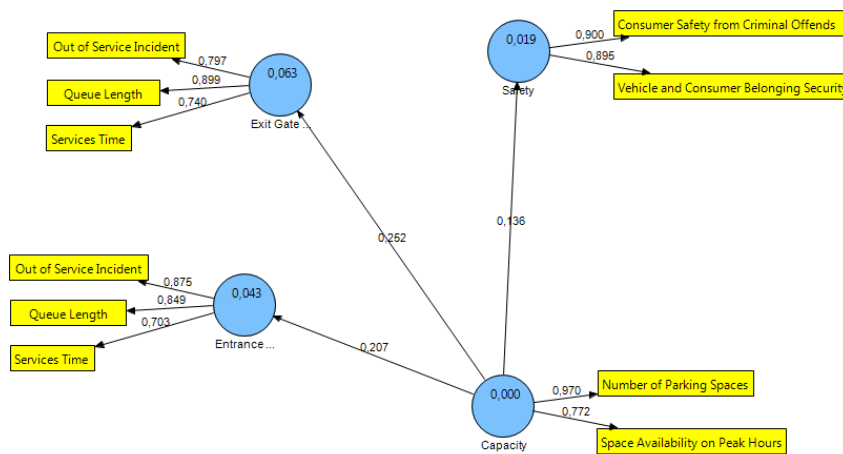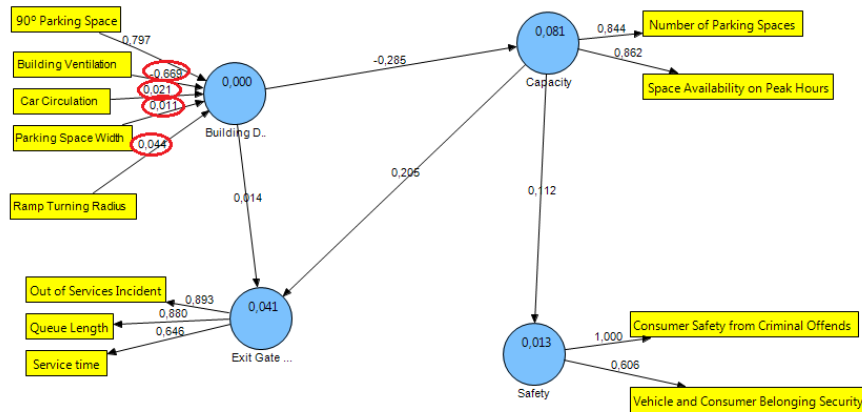

Figure 1 Motorcycle User Perception Model

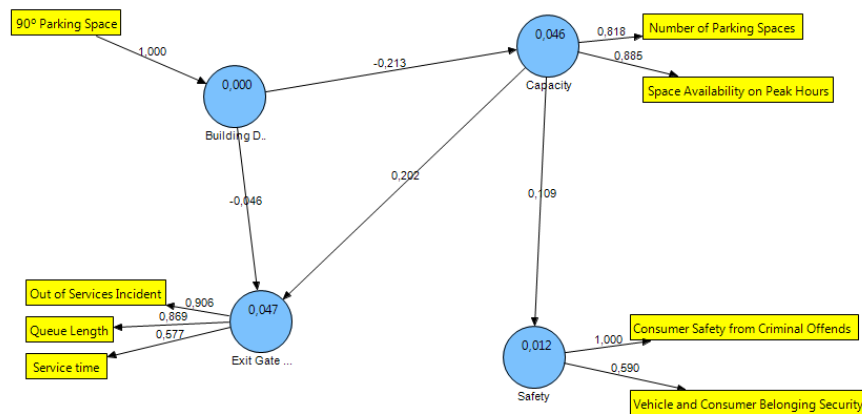**Figure 2** Car User Perception Full Model

Figure 3 Car User Perception Final Model

Table 3 summarize the valid indicators for motorcycle and car user perception models. It should be noted that car entrance gate services construct and motorcycle parking building design construct have been removed from the model after the validitity and reliability tests following the main survey.

Table 3 Summary of Valid Indicators with Standardized Loading Factor at Least 0.5

Constructs	Valid indicators	
	Car models	Motorcycle models
Parking capacity	Number of parking spaces Availibility of parking spaces on peak hours	Number of parking spaces Availibility of parking spaces on peak hours
Entrance gatservices	████████████	Service time Queue length Out of service incident
Exit gate services	Service time Queue length Out of service incident	Service time Queue length Out of service incident
Parking safety and security	Vehicle and consumer belongings security Consumer saftey from criminal offends	Vehicle and consumer belongings security Consumer saftey from criminal offends
Parking building design	90° parking space	████████████

CONCLUSION

Valid indicators expressing car and motorcycle parking services constructs were in general the same for parking capacity, exit gate services and parking safety/ security. On the other hand valid indicator for parking building design was only found in car model and valid indicators for entrance gate services construct were only found in motorcycle model.

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