THE INFLUENCE OF PARKING ATTENDANT AND PARKING FACILITIES ON USER SATISFACTION OF CAR PARKING ON NGURAH RAI STREET GIANYAR CITY

1) Department of Civil Engineering, Faculty of Engineering, Universitas Hindu Indonesia, Denpasar, Bali
2) Civil Engineering Department, Politeknik Negeri Bali, Bukit Jimbaran, Badung Bali

Correponding email [1]: gustu107@gmail.com

Ida Bagus Wirahaji [1], I Ketut Sutapa [2]

Abstract. Driver satisfaction in making a trip is influenced by the quality of parking services. The purpose of this study was to analyze the effect of parking attendants and parking facilities on the satisfaction of car park users on Jalan Ngurah Rai, in Gianyar City, which is currently working on revitalizing traditional markets with modern concepts. Research using survey methods, distributing questionnaires to obtain 100 sheets of parking service user perception data. The results of the analysis show that the regression equation obtained is $Y = 2.354 + 0.281 X1 + 0.672 X2$. The parking attendant and parking facilities variables both partially and simultaneously have a significant positive effect on the user satisfaction variable. Value of Sig. variable parking attendant and parking facilities respectively $0.000 < 0.05$. The value of tcount for parking attendants and parking facilities are 9,500 and 20.921, respectively $> t_{table} = 1.9872$. $F_{count} = 312.296 > 0.025324$. The ability of the parking attendant and parking facilities variable in influencing the user satisfaction variable is quite large, as indicated by the coefficient value. determination (R^2) of 86.3%.

Keywords: parking attendant, parking facilities, user satisfaction, regression model

1. INTRODUCTION

Parking is an important component of the urban transportation system. With the continuous increase of uncontrolled car ownership and limited availability of infrastructure and land resources, parking problems become a formidable challenge for transportation managers [1]. The increase in car ownership and car use gives rise to a growing conflict between demand and availability of parking spaces [2]

The limited land available for adequate parking areas in office and shopping centers causes consumers to park their vehicles on the road, which results in disruption of traffic flow [3]. The high demand for on-street parking poses a major challenge to transportation management, which has also received great attention from researchers. A large number of studies have been carried out to improve on-street parking management, from either a survey-based or a modeling-based perspective [4]

On-street parking is one of the most frequently seen prototypes of parking, both paid and unpaid, which causes vehicles moving on the road to share width with parked vehicles [5]. On-street parking has several natural contributions to the economy and safety of road users. But this of course, has some negative effects, such as reduction of road capacity, frequent occurrence of accidents on main roads [6]. However, previous studies have found a positive relationship between public parking provision and household car ownership and use [7] [8].

In practice, parking policies are often opportunistic. In low-density areas with segregated housing, parking policies may not have much effect due to the large amount of land available for parking facilities, while in high-density neighborhoods conflicts of interest between car owners and non-owners over land are common [9]. Especially in inner-city areas that serve as destinations for travel, shopping and recreation as well as in residential neighborhoods with high population density and land use [10].

Driver satisfaction in traveling is influenced by the ease of getting parking attendant parking facilities, rates, security and comfort. Driving satisfaction decreases when the driver is difficult to get parking facilities [11]. This study focuses on the satisfaction of parking service users on the quality of the service itself, namely parking attendants and parking facilities, while parking rates are easily affordable. User satisfaction is an important indicator to evaluate services. Studies on parking satisfaction mostly focus on the service itself where parking is a part of travel satisfaction.

The city of Gianyar, this year is working to revitalize the traditional market with a modern concept [12]. The research was conducted on Jalan Ngurah Rai which is the main and most populous road in Gianyar City, precisely at the intersection of Jalan Ksatrian - Jalan Captain Dipta intersection, 420 m long, type 2/2U road, 15.40 m wide. The car park slots are 79 SRP, with a size of 4.6 x 3.30 m2, forming an angle of 450 taking the road (on-street parking) north of the road. Meanwhile, motorbike parking is provided on off-street parking for 100 m to the north of the road with a width of 6.5 m.

2. METHODS

This study is an observational survey method, taking a sample of 100 respondents, using a questionnaire as an instrument to collect data from the population of car park users on Jalan Ngurah Rai in Gianyar City. The measurement is the perception of parking service users, where the analysis is the parking interpreter and parking facilities. Parking attendants are people/officers who provide services, while parking facilities are places/slots for car parking in the SRP. Data analysis used multiple linear regression statistical method with SPSS ver.26 software.

The measurement scale used is a Likert scale with a score of 1 – 5, as shown in Table 1.

Table 1. Perception and Score

No	Perception	Score
1	Strongly disagree	1
2	Do not agree	2
3	Somewhat agree	3
4	Agree	4
5	Strongly agree	5

2.1 Validity and Reliability Test

Validity and reliability tests were carried out by analyzing the perception data of 30 respondents. The validity test method used is Pearson Product Moment, where if the correlation value is 0.3, then the instrument is declared valid [13]. The reliability test method is the Cronbach's Alpha coefficient method, because the research instrument is in the form of a questionnaire. Cronbach's Alpha coefficient value must be 0.6 so that the instrument can be declared reliable [14].

2.2 Multiple Linear Regression Model

In this study, the multiple linear analysis method was used to predict the state of the dependent variable, if two or more independent variables as predictors changed. The linear regression equation can be formulated as equation 2.1 [15]:

$$Y = a + b_1 X_1 + b_2 X_2 \quad\text{.. (1)}$$

Where:

Y = parking user satisfaction level
a = constant
b1, b2 = regression coefficient
X1 = parking attendant attitude
X2 = parking lot condition

2.3   Test t, F, dan R^2

t test is used to test the effect of each independent variable individually or partially on the dependent variable. This test is done by comparing the value of tcount > ttable, and the value of Sig. less than = 0.05, then the independent variable has a significant effect [14].

The F test is used to simultaneously test the effect of the independent variable on the dependent variable. This test is carried out by comparing the significance of the value of Fcount > Ftable, then the formulated model has met. If the value of Fcount > Ftable, it can be interpreted as a joint effect, with a determined significance level of 0.05 (α = 0.05) [14].

The coefficient of determination (R2) test is used to measure how far the model's ability to explain the variation of the dependent variable is. The value of the coefficient of determination (R2) is between 0 and 1. A value of R2 that is close to 0 means that the ability of the independent variable to explain the variation of the dependent variable is small, whereas the value of R2 that is close to 1 means that the ability of the independent variable to explain the variation of the dependent variable is large [14].

2.4 Research Model Schematic

In this study, two independent variables were used to explain one dependent variable. Parking interpreter variable (X1) and parking facility (X2), as independent variables, and user satisfaction variable (Y) as dependent variable. Figure 1 shows the schematic of the research model.
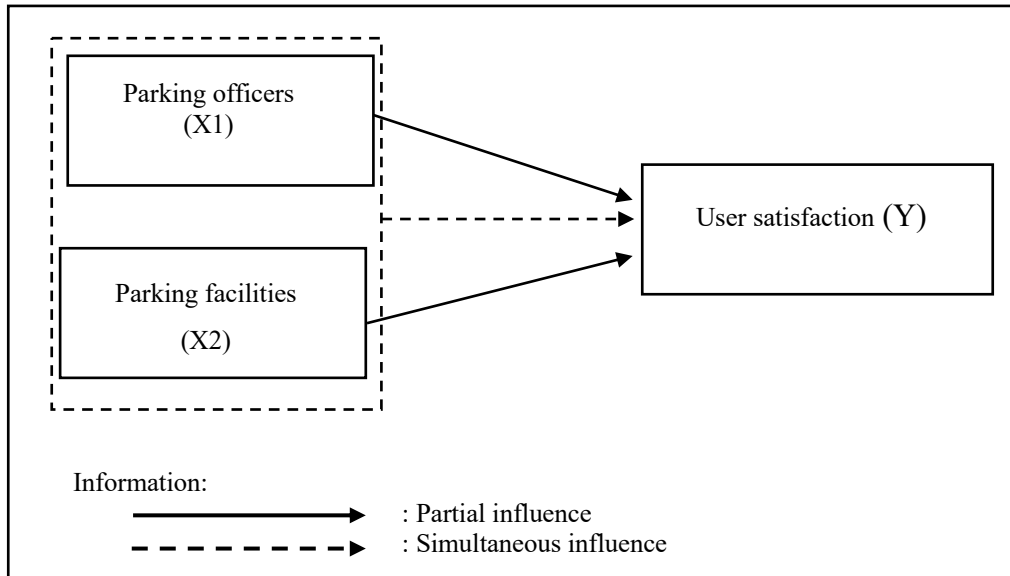

Figure 1. Research Model Schematic

3. RESULTS AND DISCUSSION

3.1 Validity and reliability test
Of the 30 questionnaires that have been distributed to test the validity and reliability, the results obtained, as shown in Table 2.

Table 2. Validity and Reliability Test Results

Variable	Corected item-Total Correlation	Cronbach's Alpha if Item Deleted
X11	0,839	0,753
X12	0,655	0,814
X13	0,593	0,825
X14	0,488	0,850
X15	0,706	0,797
X21	0,763	0,817
X22	0,636	0,850
X23	0,670	0,841
X24	0,710	0,831
X25	0,657	0,845
Y1	0,499	0,728
Y2	0,751	0,634
Y3	0,551	0,711
Y4	0,379	0,764
Y5	0,488	0,733

Table 2 shows the Corrected Item-Total Correlation of all indicators. All indicators meet the requirements of 0.3. The smallest value is owned by the Y4 indicator 0.379 and the largest indicator X11 with a value of 0.839. Meanwhile, in Cronbach's Alpha if Item Deleted column, it can be seen that all indicator values meet the requirements of 0.6. The smallest value on the Y2 indicator is 0.634, the largest on the indicator but still meets the requirements > 0.6. Thus the instrument is declared valid and reliable.

3.2 Multiple Linear Regression Model

Based on the results of the analysis of 100 questionnaires that have been distributed, the regression equation coefficient and t-test value (partial), as shown in Table 3.

$$Y = 2,354 + 0,281\ X1 + 0,672\ X2 \quad \text{.. (2)}$$

Table 3. Coefficient of Regression Equation and t Test Value (partial)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,354	0,704		3,343	0,001
	Parking attendant (X1)	0,281	0,030	0,360	9,500	0,000
	Parking Facility (X2)	0,672	0,032	0,793	20,921	0,000
	a. Dependent Variable: Usage satisfaction (Y)					

From Table 3, the constant value is 2.354, the parking attendant variable coefficient (X1) is 0.281, the parking facility variable coefficient (X2) is 0.672, so that the regression equation (2) is obtained. The regression equation shows the relationship between the parking attendant variable (X1), Parking Facilities (X2) as the independent variable, and User Satisfaction (Y) as the dependent variable. From the regression model can be seen:

1. The value of the constant is 2.354, meaning that if there is no change in the value of the independent variable parking attendant and parking facilities (X1 and X2 values are 0) then the dependent variable User Satisfaction (Y) is 2.354 units.
2. Coef value. parking attendant regression (X1) is 0.281, meaning that if the parking attendant variable (X1) increases by 1% with the assumption that the parking facility variable (X2) and constant (a) is 0 (zero), then the User Satisfaction variable increases by 0.281. Parking attendant variable (X1) contributes positively to User Satisfaction (Y).
3. Coef value. Parking Facility regression (X2) is 0.672, meaning that if the Parking Facility variable (X2) increases by 1%, assuming the parking attendant variable value (X1) and constant is 0, then User Satisfaction increases by 0.672.

3.3 T-Test Results (Partial)

Based on Table 3, taking into account the rows of columns t and sig, it can be explained as follows:

1. Parking attendant variable (X1) has a positive and significant effect on User Satisfaction (Y). This can be seen from the significance value of the parking attendant (X1) 0.000 < 0.05. Then the value of ttable = (α/2; n-k-1) = (0.025;100-2-1) = (0.025;97) = 1.9872. It means that the value of tcount = 9.500 > ttable = 1.9872. Thus, the hypothesis which states: "Parking attendant (X1) has an effect on User Satisfaction (Y)", is partially accepted. The ttable value can be searched from Excel with the formula: "=T.INV(probabilit;deg_freedom1).
2. Parking Facility Variable (X2) has a positive and significant effect on User Satisfaction (Y). This can be seen from the significance value of Parking Facilities (X2) 0.000 < 0.05. Then the value of ttable = (α/2; n-k-1) = (0.025;100-2-1) = (0.025;97) = 1.9872. It means that the value of tcount = 20,921 > ttable = 1.9872. Thus, the hypothesis which states: "Parking Facilities (X1) has an effect on User Satisfaction (Y)", is partially accepted.

3.4 F Test Results (Simultaneous)

Table 4 shows the magnitude of the influence of the parking attendant (X1) and parking facilities (X2) variables together (sumultaneously) on the User Satisfaction variable (Y).

Table 4. F Test Value (Simultaneous)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	421,457	2	210,729	312,296	.000[b]
	Residual	65,453	97	0,675		
	Total	486,910	99			

a. Dependent Variable: Kepuasan Pengguna (Y)

b. Predictors: (Constant), Juru Parkir (X1), Fasilitas Parkir (X2)

From Table 4, it can be seen that the value of Sig. $0.000 < 0.05$, and the value of Fcount = 312.296. Ftable value = $(\alpha/2; k;n-k)$ = (0.025;2;100-2); (0.025;2;98), then Ftable = 0.025324. Meanwhile, Fcount = 312.295 > Ftable = 0.025324. Thus, it can be concluded that the parking attendant variable (X1) and Parking Facility (X2) have a significant or simultaneous effect on the independent variable User Satisfaction (Y). This Ftable value can be obtained from Excel software calculations with the formula "=F.INV(probability;deg_freedom1;deg_Freedom2)"

3.5 Coef Test Results. Determination (R2)
Table 5 shows the coefficients. determination (R2) a measuring tool used to describe how much variation is described in the model.

Table 5 Coef Value. Determination (R2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.930[a]	0,866	0,863	0,821

a. Predictors: (Constant), Juru Parkir (X1), Fasilitas Parkir (X2)

From Table 5 it can be seen that the value of the coefficient. determination (R2) is found in the Adjusted R Square value, which is 0.863. This shows the ability of the independent variable to explain the dependent variable is 86.3%, the remaining 13.7% is explained by other variables not discussed in this study.

4. CONCLUSION
Parking attendants and parking facilities greatly determine the level of satisfaction of parking users in the City of Gianyar. This is evidenced by the results of the analysis, namely:
1. The regression equation obtained is Y = 2.354 + 0.281 X1 + 0.672 X2.
2. The variable parking attendant and parking facilities partially have a positive significant effect on the variable user satisfaction. The parking attendant variable has a value of Sig. = $0.000 < 0.05$, thiutng = 9.500 > t table = 1.9872. The Parking Facility variable has a value of Sig. = $0.000 < 0.05$, thiutng = 20.921 > t table = 1.9872.
3. The variable parking attendant and parking facilities, together (simultaneously) have a significant positive effect on the User Satisfaction variable, with a value of Sig. = $0.000 < 0.05$, and the value of Fcount = 312.296 > Ftable = 0.025324.
4. The ability of the parking attendants and parking facilities to influence the User Satisfaction variable is quite large, namely the value of Adjusted R Square = 86.3%. The rest is influenced by other variables not discussed in this study.

5. REFERENCES

[1]   Xiao, H., Xu, M., dan Gao, Z. 2018. "Shared parking problem: A novel truthful double auction mechanism approach." *Transportation Research Part B* 109:40–69.

[2]   Wang, H., Li, R., Wang, X.X., dan Shang, P. 2020. "Effect of on-street parking pricing policies on parking haracteristics: A case study of Nanning." *Transportation Research Part A: Policy and Practice* 137:65–78.

[3]   Agustina, D. 2016. "Pengaruh Parkir pada Badan Jalan terhadap Kapasitas Jalan." *DIMENSI*

[4]   Mo, B., Kong, H., Wang, H., Wang, X., dan Li, R. 2021. "Impact of pricing policy change on on-street parking demand and user satisfaction: A case study in Nanning, China." *Transportation Research Part A.*

[5]   Biswas, S., Candra, S., dan Gosh, I. 2017. "Estimation of Vehicular Speed and Passenger Car Equivalent Under Mixed Traffic Condition Using Artificial Neural Network." *Arab J Sci Eng.*

[6]   Marshall, W.E., Garrick, N.W., dan Hansen, G. 2008. "Reassesing On-Street Parking." *Journal of the Transportation Research Board* 2046(1):45-52.

[7]   Guo, Z. 2013. "Does residential parking supply affect household cr ownership? The case of New York City." *Journal Transp Geography* 26:18-28.

[8]   Tyrinopoulos, Y., dan Antoniou, C. 2013. "Factors affecting modal choice in urban mobility." *Europ. Transp. Res* 5(1):27-39.

[9]   Taylor, E. 2014. "Fight the towers! Or kiss your car park goodbye: How often do residents assert car parking rights in Melbourne planning appeals?" *Plann Theory Practice* 15(3):328-348.

[10]   Scheiner, J., Faust, N., Helmer, J., Straub, M., dan Holz-Rau, C. 2020. "What's that garage for? Private parking and on-street parking in a high-density urban residential neighbourhood " *Journal of Transport Geography* 85:1-23. doi: 10.1016/j.jtrangeo.2020.102714.

[11]   Xue, Y., Fan, H., dan Guan, H. 2019. "Commuter departure time choice considering parking space shortage 18 and commuter's bounded rationality." *J. Adv. Transp.*

[12]   Gunarta, I W.E. 2021. "Proyek Pasar Umum Gianyar Berjalan 57,72 Persen, Target Rampung November 2021". Editor: IA S Putri. Tribun-Bali. Available at https://bali.tribunnews.com/2021/05/21/proyek-pasar-umum-gianyar. Acessed 16 August 2021

[13]   Arikunto, S. 2013. *Prosedur Penelitian: Suatu Pendekatan Praktek*. Jakarta: Rineka Cipta

[14]   Ghozali, I. 2018. *Aplikasi Analisis Multivariate dengan Program IBM SPSS. 25*. Semarang: Badan Penerbit Universitas Diponegoro.

[15]   Sugiyono. 2013. *Statistika Untuk Penelitian*. Bandung: Alfabeta.