Analysis of Online Transportation User Satisfaction Using the Customer Satisfaction Index (CSI) and Important Performance Analysis (IPA) Methods In Palembang City

Merry Agustina[1], Vivi Sahfitri[2,*], Triani Astuti[3]

[1,3]Bussiness Administration Departement, Bina Darma University, Palembang, Indonesia
[2] Informatics Management Departement, Bina Darma University, Palembang, Indonesia
Email: [1]merry_agst@binadarma.ac.id, [2]vivi_sahfitri@binadarma.ac.id[*]

Abstract

The development of Information Technology today has brought many changes in various fields of human life. One of them is the field of transportation services. The existence of online transportation is slowly shifting the use of conventional public transportation. Online Transportation is a transportation service that utilizes network technology, which is based on the internet network in carrying out all its transaction activities. The increasing number of users of online transportation services is an option for the public to use these services based on satisfaction with the services provided to their customers. This study aims to determine the level of satisfaction of online transportation users using the Customer Satisfaction Index (CSI) Method and the Importance Performance Analysis (IPA) method. The results showed that the level of user satisfaction measured by the CSI method showed a satisfaction index of 0.7728 or 77.28%, which means that the satisfaction index value of online transportation users is on the criteria of "Satisfied". Measurements using the IPA method show that there are three attributes that are at the top priority, seven attributes that need to be maintained, five attributes that have low priority and four attributes that have excess performance.

Keywords: Online Transportation, Customer Service Index (CSI), Importance Performance Analysis (IPA)

1. INTRODUCTION

The development of information and communication technology has an influence in various fields, including education, economics, communication, transportation and many others. The most fundamental change today is the increasing number of online transaction facilities that can be used to meet the needs of the community, one of which is online transportation services that are increasingly prevalent and become people's choice to support their mobility. The existence of online transportation is slowly shifting the use of conventional

public transportation. Online Transportation is a transportation service that utilizes internet network technology in all transaction activities, ranging from ordering transportation services, monitoring the lines of both pick-up and destination, paying for service services, and providing an assessment of transportation services provided using an online-based application [8]. The increasing public need for online transportation services is one of the reasons for the emergence of various online transportation applications such as Gojek, Grab, Maxim, InDriver and others. The existence of online transportation began with the increasing use of smartphones as a means of communication which is growing rapidly. If previously to get conventional transportation services, customers had to wait at the bus stop or wait for the transportation to pass or contact the taxi Customer Service [7]. Currently, with the existence of online transportation applications and the existence of smartphones, this is easier to do. Only by ordering online using a smartphone, the driver will come to pick up at the requested location and deliver to the destination location at a predetermined price applied. The increasing use of online transportation has caused many people to start switching from conventional transportation services to online transportation services. According to a survey conducted by the Indonesian Internet Service Providers Association (APJII) in the period from 2019 to the second quarter of 2020 [2] using questionnaires and interviews from 7000 samples with a margin of error of 1.27%, shown in figure 1.
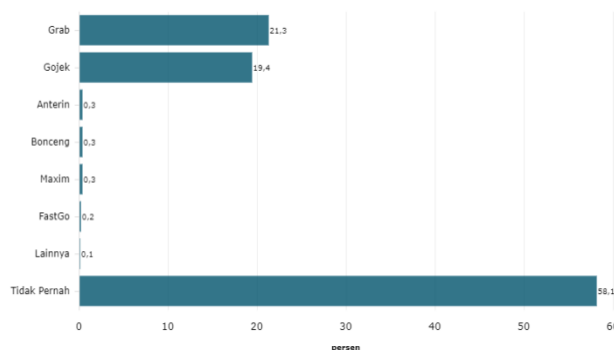
Figure 1. Users of online transportation application services

Figure 1 shows that the most widely used online transportation application services are Grab application with 21.3% and Gojek with 19.4%. While other online transportation applications such as Maxim, FastGo, Anterin, Bonceng have users of 0.1% - 0.3% and 58.1% of research respondents chose the answer of never using an online transportation application service. Based on the results of research conducted by Google, temasek and Bain & Company showed an increase in the value of the digital economy from online transportation services and online food delivery services until 2025 which was shown by the gross

merchandise value (GMV) of US$ 6.9 billion in 2021. Manuscripts arranged with the following order of topics [5].

The increasing number of online transportation service providers as shown in figure 1, become a competition in the transportation business, especially online-based transportation. The increasing number of online transportation services will increase the intensity of competition and the number of competitors. The competition requires companies to always pay attention to the needs and desires of consumers and try to meet consumer expectations by providing more satisfactory services than competitors. Satisfaction is a comparison between the results or performance obtained with what is expected, it can be in the form of goods or services [9]. Factors affecting user satisfaction include; total consumer value consisting of product value, service value, personal value, image value and total consumer cost value consisting of monetary costs, time costs, labor costs and thought costs [6]. One of the factors that determine user satisfaction is the user's perception of the quality of services. An assessment of user satisfaction is a necessity for the management of the company. Satisfaction assessment is an evaluation for management to improve service and win the competition. It has become a fundamental need, both for individuals and companies in increasing productivity and improving products and improving the quality of service to consumers, especially in the transportation business.

This study aims to determine the level of satisfaction of online transportation users using the Customer Satisfaction Index (CSI) method and Important Performance Analysis (IPA) Methods. The Customer Satisfaction Index (CSI) method is used to determine the level of user satisfaction with online transportation services as a whole by using an approach that considers the importance of the measured attributes [14]. The CSI method is quite easy and simple to apply to measure the consumer satisfaction index because it uses a scale that has a fairly high sensitivity and reliability [1]. The implementation of CSI can provide measurement results related to customer satisfaction and can be a reference and input for improvements and targets that will be achieved in the future [4]. Importance Performance Analysis (IPA) is used to determine the level of consumer satisfaction, what things need to be improved and what needs to be maintained based on data generated from respondents which will be the basis for improving and increasing user satisfaction. This method will provide a level of satisfaction by generating a degree of conformity to the expected satisfaction. The level of conformity obtained by comparing the implementation performance score with the importance score so that a priority scale will be obtained that will be used in handling. The IPA was measured using the likert scale to determine the importance level score and the satisfaction/performance level score of the respondent's answers with a 5-level measurement scale [9]. In the IPA method, the measurement of customer satisfaction levels will be mapped in the quadrant on the IPA Map [13].

The results of the study are expected to provide empirical information and evidence about the level of satisfaction in users of online transportation services by using the Customer Satisfaction Index (CSI) Method and the Importance Performance Analysis (IPA) method which will be the basis for continuing to improve and improve user satisfaction, so that they will continue to use online transportation services.

2. METHODS

2.1. Research Methods

This research is quantitative research that aims to examine a certain population or sample as an effort to find out or solve problems about the implementation of IT-based technological innovations using certain research instruments, data analysis that is quantitative or statistical in nature that aims to test hypotheses that have been determined in the study [10]. This study uses the Customer Satisfaction Index (CSI) method to determine the level of consumer satisfaction and the Importance Performance Analysis (IPA) method for attributes that must be improved to increase consumer satisfaction. Figure 4 shows the design in this study.
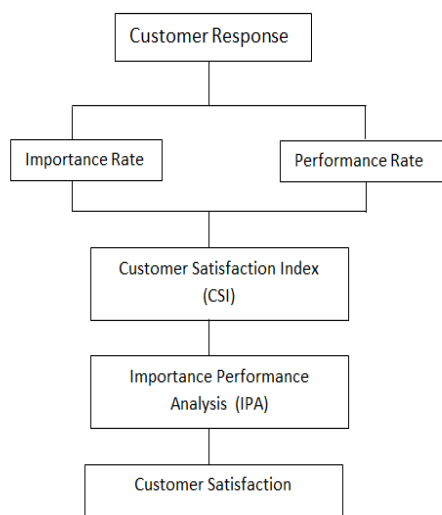
Figure 2. Research design

2.2. Location and Subject of Research

This research was conducted in Palembang City, and the subject of the study was the user of online transportation services, both motorbikes and cars, for all available applications.

2.3. Population and samples

The population in this study is all users of online transportation in Palembang City. The determination of samples in this study uses the purposive sampling method, which is a sample determination technique by making certain considerations so that it is suitable for being used as a sample [11]. The sample in this study was determined using Paul Leedy's formula with a Margin of error (moe) 10% and a confidence level 95% (Z = 1.96). A Confidence Level 95% or z=1.96 is the most frequently used confidence level that provides a balance between precision and reliability [12].

$$n = \left(\frac{z}{e}\right)^2 (p)(1-p) \dots\dots\dots\dots\dots\dots\dots\dots(1)$$

The population in this study has an exact number. Determination of the number of samples by applying Paul Leedy's formula with an unknown number of populations, then the price (p)(1-p) is worth a maximum of 0.25. In the determination of this sample will be used confidence level 95% with an error rate of not more than 10%, so that the samples in this study are:

$$n = \left(\frac{1,96}{0,1}\right)^2 (0,25) = 96,04$$

2.4. Data Analysis

The data of this study will be analyzed using the Customer Satisfaction Index (CSI) method and the Importance Performance Analysis (IPA) Method.
In the CSI method, the Consumer Satisfaction Index is calculated by the following stages [15];
a. Determine the Mean Importance Score (MIS), which is the average of the importance level and the Mean Satisfaction Score (MSS), which is the average value of the performance level.
b. Calculates the Weighting Factor (WF), which is obtained from the calculation of the MIS value per attribute which is then divided by the total amount of MIS multiplied by 100.
c. Calculates the weight score (WS), which is obtained from the result of the multiplication between each item on each WF and MSS attribute.
d. Calculates the Total Median Weight (WMT), which is the total total amount of the weight score (WS) value
e. Calculating the Customer Satisfaction Index (CSI) value obtained by calculating the Total Median weight (WMT) divided by the maximum scale (5) then multiplied by 100%.

Table 1. Customer Satisfaction Index Value Criteria [3]

NO	CSI Value	CSI Criteria
1	0,81 - 1,00	Very Satisfied
2	0,66 - 0,80	Satisfied
3	0,51 – 0,65	Quite Satisfied
4	0,35 – 0,50	Unsatisfied
5	0,00 – 0,34	Very dissatisfied

To calculate the Consumer satisfaction Index using formula 2.

$$CSI = \frac{T}{5 \times y} \times 100\% \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

The Importance Performance Analysis (IPA) method is used to improve the quality of a product or service by measuring the relationship between consumer performance and priority. IPA is a method of analyzing user satisfaction with a product or service [14]. The following formula is used to determine the factors affecting satisfaction.

$$\bar{X} = \frac{\sum Xi}{n} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$
$$\bar{Y} = \frac{\sum Yi}{n} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

The following formula is used to measure the rate fit and knowing how big customers are satisfied with the performance, and how much the service provider understands what customers want about the services provided.

$$Tki = \frac{X_i}{Y_i} \times 100\% \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Analysis of the perceived level of performance and the level of user expectations can produce a Cartesian diagram that can show the location of each attribute or element that is considered to affect user satisfaction, where in the prestigious diagram there are factors that will be described in four quadrants.
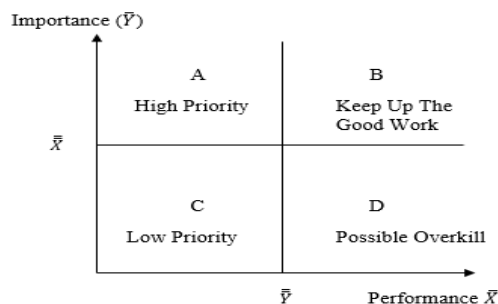
Figure 3. Importance Performance Analysis Matrix

The cartesian diagram of the Importance Performance Analysis is depicted and divided into four parts with levels of their respective attributes [13]:

a. Quadrant 1 (A) is a dimension of service that is considered important by users, but the Company provides poor service quality, making this dimension of service a top priority to improve.
b. Quadrant II (B) is a dimension of service that is considered important by users and companies already provide quality services and must maintain this dimension of service.
c. Quadrant II (C) is seen as less important by service users and companies already provide services with poor quality, so the dimensions of this service are given a lower priority.
d. Quadrant IV (D) is a dimension of service that is considered unimportant by users, but the company provides services with good quality so that this dimension of service becomes excessive.

3.   RESULTS AND DISCUSSION

3.1. Customer Satisfaction Index (CSI)

Measuring user satisfaction is very important to know how online transportation services are performing. Measurement uses the Customer Satisfaction Index (CSI) method by determining the average score of the level of performance and the level of importance in each attribute. Based on the results of calculations carried out in this study, the CSI score was 77.28%. The CSI value was obtained by dividing the total Weight Score (WS) value by the maximum scale used in this study which was 5 and multiplied by 100%. It can be seen in table 2.

Table 2. Customer Satisfaction Index (CSI) Analysis Results

Item Code	MIS	WF	MSS	WS
P01	4,18	3,32	3,90	20,74
P02	4,29	5,47	4,01	21,93
P03	4,21	5,20	3,81	19,80
P04	4,28	5,30	3,89	20,64
P05	4,28	5,33	3,91	20,85
P06	4,22	5,14	3,77	19,38
P07	4,21	5,07	3,72	18,87
P08	4,23	5,11	3,75	19,18
P09	4,22	5,47	4,01	21,93
P10	4,18	5,06	3,71	18,77
P11	4,12	4,80	3,52	16,90
P12	4,19	5,21	3,82	19,90
P13	4,23	5,30	3,89	20,64
P14	4,22	5,25	3,85	20,21
P15	4,21	5,26	3,86	20,32
P16	4,23	5,32	3,90	20,74

Item Code	MIS	WF	MSS	WS
P17	4,20	5,32	3,90	20,74
P18	4,13	5,35	3,92	20,96
P19	4,32	5,71	4,19	23,94
	WT			**386,42**
	CSI (%)			**77,28**

In table 2, the value obtained from the Customer Satisfaction Index (CSI) in online transportation users is 77.28% or has an index of 0.7728. Based on the User Satisfaction Index, the CSI value of 77.28% or 0.7728 based on table 1 is on the criteria of 0.66 – 0.80 which means that the User Satisfaction Index for online transportation services is in the criteria of "Satisfied".

2.2. Importance Performance Analysis (IPA)

Basically, every business has attributes that affect customer satisfaction that need to be improved or maintained. Based on the results of online transportation user satisfaction which is calculated from the CSI Value and is still below 100%, so it is very necessary to increase the level of User satisfaction. Increasing user satisfaction can be done by increasing the level of perception and expectation. Attributes that should be prioritized are attributes that are very important to the user, but the level of activity is still considered poor by visitors.

The way that can be used to increase the level of importance and performance is to use the Importance Performance Analysis (IPA) method. This method can determine the priority at the level of perception and expectation of the respective attributes presented in a Cartesian diagram divided into 4 quadrants. The location of the attribute is obtained from the result of the sum of the average values of the level of importance and the level of performance.
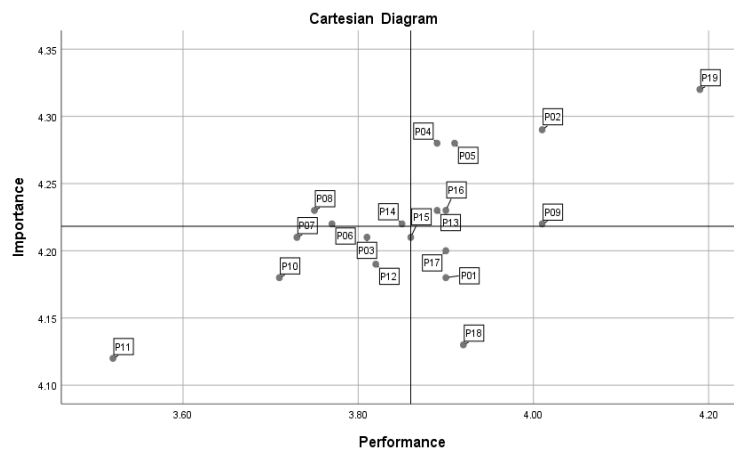
Table 3. Average Of Importance and Performance Level

Item Code	Importance level	Performance Level
P01	4,18	3,90
P02	4,29	4,01
P03	4,21	3,81
P04	4,28	3,89
P05	4,28	3,91
P06	4,22	3,77
P07	4,21	3,72
P08	4,23	3,75
P09	4,22	4,01
P10	4,18	3,71
P11	4,12	3,52
P12	4,19	3,82
P13	4,23	3,89

Item Code	Importance level	Performance Level
P14	4,22	3,85
P15	4,21	3,86
P16	4,23	3,90
P17	4,20	3,90
P18	4,13	3,92
P19	4,32	4,19
Average	**4,21**	**3,85**

In table 3 the average value at the importance level is 4.21 and the average performance level is 3.85. Based on these two values that will determine the centerline on the Cartesian Importance Performance Analysis (IPA) diagram and divide the Cartesian diagram into four quadrants. Each quadrant has different circumstances.

Figure 4. Cartesian Diagram of Importance Performance Analysis

Figure 5 shows the positions on the Cartesian diagram based on importance and performance. This makes it possible for online transportation services to improve the attributes that are considered most important by users. The following is the result of mapping the four quadrants on the Cartesian diagram

1) Quadrant 1

Quadrant I is a high-priority quadrant. The user considers important the attributes present in this quadrant, but the performance on the perceived ones does not match what the user expects. The attributes included in this quadrant are:

a. Timely Drivers (P06)

b. Drivers are quick and responsive to situations encountered while the order is in progress (P08)

c. Drivers pick up and drop off customers to their destination on time (P14)

These three attributes must be the top priority for online transportation service providers to improve their performance and also the satisfaction of online transportation users

2) Quadrant II

Quadrant II includes attributes that are considered to be in line with users expectations of perceived performance. The attributes included in this quadrant are:

a. Drivers always obey traffic signs (P02)
b. Drivers Drive Safely (P04)
c. Drivers are friendly when contacted or dialed back via Chat or Call (P05)
d. The driver is responsible for the duration of the order until it arrives at the end of the customer's order (P09)
e. Drivers have good manners when interacting with customers (P13)
f. Drivers are friendly and polite (P16)
g. I always give 4/5 stars to the drivers of the online transportation services I use (P19)

The seven attributes in quadrant II are attributes that must be maintained by online transportation service providers because the implementation of performance is in accordance with user expectations.

3) Quadrant III

Quadrant III is the quadrant with lower priority. Attributes in this quadrant are considered less important because they do not perform well. The attributes included in this quadrant are:

a. The vehicle used provides comfort when driving (P03)
b. The driver understands well the route of the road (P07)
c. Drivers receive criticism and suggestions directly from customers (P10)
d. Drivers are willing to explain to customers about the application being used and updated (P11)
e. Drivers provide a sense of security to customers (P12)

The five attributes of quadrant II are those that have a low importance and are not so necessary in measuring performance.

4) Quadrant IV

Quadrant IV contains attributes that are considered less important by the user, but the services offered are already excellent. The attributes included in this quadrant are:

a. The vehicle used is suitable for use as transportation (P01)
b. Drivers pick up and drop off customers according to the estimates provided by the application (P15)
c. I am satisfied with the service provided by the online transportation application that I use (P17)
d. I recommend using this online transportation service to other family members (P18)

These four quadrant IV attributes are attributes that have a low level of importance but a high level of performance execution from the online transportation service provider

Based on the results of the analysis by the method, it is known that: there are three attributes that must be improved in performance, namely items P06, P08 and P14. These three items have the highest priority for repair, which will increase user satisfaction. The statements on P01, P15, P17 and P18 can be maintained because they already have a higher level of performance than the level of importance of the user.

4. CONCLUSION

Based on the discussion and data processing that has been carried out in the research, it can be concluded that the results of measuring the level of satisfaction using the Customer Satisfaction Index (CSI) method which through several stages of calculation, the user satisfaction level gets a satisfaction index value of 0.7728 or 77.28% is in the range of 0.60 - 0.80 which means, the satisfaction index value of online transportation users is on the criteria of "Satisfied".

Based on the analysis using the Importance Performance Analysis (IPA) methodology, there are three service attributes that are included in the top priority. This indicates that the performance of these attributes is considered not optimal for the user. These attributes are considered very important, but users still feel lacking in their implementation, so it is necessary to improve the performance of these attributes in order to increase user satisfaction. There are seven attributes that have good performance according to the user, so it is necessary to maintain their achievements and even more improved. Five service attributes that fall into a low priority that prove that there are still attributes that cannot provide satisfaction to users and four attributes that are overvalued by the user, which means that the user considers these attributes to be less important to the user, so it is worth considering reducing performance. In other words, users do not consider this attribute very important to them and should be considered to reduce performance.

REFERENCES

[1]   Anggraini, L., Deoranto, P., & Ikasari, D. (2013). Analisis Persepsi Konsumen Menggunakan Metode Importance Performance Analysis dan Customer Satisfaction Index. *Jurnal Fakultas Teknologi Industri Pertanian Universitas Brawijaya*, 74-81.

[2]　Bayu, D. J. (2020). *Grab dan Gojek, Layanan Transportasi Online Paling Populer di Masyarakat.* Retrived From: https://databoks.katadata.co.id

[3]　Bhote. (1996). *Beyond Customer Satisfaction to Customer Loyalty: The key to Great.* New york: AMA Membership Publications Division, American Management Association.

[4]　Indrajaya, D. (2018). Analisis Kualitas Pelayanan Terhadap Tingkat Kepuasan Konsumen Menggunakan Metode Importance Performance Analysis dan Customer Satisfaction Index Pada UKM Gallery. *Jurnal IKRA-ITH Teknologi*, Vol. 2 No. 3 pp. 1-6.

[5]　Jayani, D. H. (2021). *Layanan Transportasi dan Antar Makanan Online diproyeksikan capai US$ 16,8 Miliar pada tahun 2025.* Retrieved From: https://databoks.katadata.co.id/datapublish/2021/11/13/layanan-transportasi-dan-antar-makanan-online-diproyeksikan-capai-us-168-miliar-pada-2025.

[6]　Kotler, P., & Amstrong, G. (2012). *Prinsip-Prinsip Pemasaran.* Jakarta: Erlangga.

[7]　Margiono, P. B., & Cahyono, K. E. (2017). Kontroversi Transportasi Online Sebagai Dasar Pembenahan Fasiltas Layanan Penumpang Bagi Pelaku Bisnis Transportasi Di Surabaya. *Seminar Nasional Multi Disiplin Ilmu*, (pp. 663-668). Surabaya.

[8]　Pratama, G. Y., & Suradi, A. (2019). Perlindungan Hukum Terhadap data Probadi Pengguna Jasa Transportasi Online dari Tindakan Penyalahgunaan Pihak Penyedia Jasa Berdasarkan Undang-undang Nomor 8 tahun 1999 tentang perlindungan konsumen. *Diponegoro Lawa Journal*, Vol.5 No.3 pp.2-3.

[9]　Purbobinuko, Z. K., & Wurianing, R. (2020). Analisis Kepuasan dengan Metode CSI dan IPA Terhadap Pelayanan Penyediaan Rekam Medis Rawat Jalan di RS. Dr Soetarto Yogyakarta. *Indonesian of Health Information Management Journal*, Vol.8 No.2 pp. 80-91.

[10]　Sugiyono. (2012). *Memahami Penelitian Kualitatif.* Bandung: Alfabeta.

[11]　Sugiyono. (2013). *Metode Penelitian Kuantitatif, Kualitatif, dan R& D.* Bandung: Alfabeta.

[12]　Suharsimi, A. (2013). *Prosedur Penelitian: Suatu Pendekatan Praktik.* Jakarta: Rineka Cipta.

[13]　Syukhri, S. (2018). Analisis Kepuasan Mahasiswa Terhadap Pelayanan Laboratorium Jaringan Menggunakan Pendekatan Importance-Performance Analysis. *INVOTEK J.Inovasi Vokasional dan Teknologi*, Vol. 18 No. 2 pp. 109-114.

[14] Syukri, S. (2014). Penerapan Customer Satisfaction Index dan Analisis GAP Pada Kualitas Pelayanan Trans Jogja. *Jurnal Ilmiah Teknik Industri*, Vol. 13 No 2 pp.103-111.

[15] Wijaya, S. (2017). Analisis Tingkat Kepuasan Mahasiswa Terhadap Pelayanan Bagian Keuangan Dengan Metode Customer Satisfaction Index. *Jurnal Ilmiah Rekayasa dan Manajemen Sistem Informasi*, Vol.3 No. 1 pp.11-17.