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Combination of Kaizen, Design Thinking Method, and Quality Function Deployment to Design Service Quality Improvement in TransJakarta

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ABSTRACT

To support the development of TransJakarta, it is necessary to make improvements and innovations in serving users so that they are more comfortable in using TransJakarta as a transport option. The results of the data in this study are organised into stages from a combination of Kaizen Culture, Design Thinking and Quality Function Deployment. Service improvements to TransJakarta are: TransJakarta bus stops are safe and comfortable if the concept of modern bus stops, ergonomic seating, and the location of bus stops is underground or on flyovers with the concept of independent routes without being mixed with public lanes. There is no accumulation of passengers in the bus because of the rules limiting bus capacity, adding fleets, and more flexible lines or adding new routes. Easy to charge BUMN or non BUMN payment cards. No sexual harassment due to bus capacity limitation rules. Easy to buy food and drinks. All bus stops are integrated with other public transport. Not too much transit. Buses do not experience congestion due to the addition of bus fleets and the location of bus stops underground or on flyovers with the concept of independent routes without mixing with public lines.

Keywords: Design, Kaizen, Improvement, Quality, Service

1. Introduction

In facing the era of globalisation and also the development of the transportation industry is full of challenges, government opportunities should provide the best possible service, oriented towards the satisfaction and needs of the community as users, so as to increase competitiveness in terms of services in land transportation services, in particular[1].

TransJakarta is the first Bus Rapid Transit (BRT) mass transit transport in Southeast Asia and South Asia operating in the DKI Jakarta area.[2]. To support the development of TransJakarta, it is necessary to make improvements and innovations in serving users so that they are more comfortable in using TransJakarta as a transportation option.

With the increasing enthusiasm of the public to use TransJakarta services as a public transport option, TransJakarta needs to compete with other modes of transportation so that the enthusiasm of the public in using TransJakarta is maintained or even increased.[3].

Several complaints from TransJakarta users still arise. The public considers that there is no improvement in service or the results of PT Transportasi Jakarta's management performance are minimal.[4].

The expected goal in this study is to design improvements to the quality of TransJakarta services.

2. Method

Data collection in this study uses observation and interviews to obtain data related to the needs and complaints of TransJakarta bus

users. Observation is an activity called observation to trace or find out something from a phenomenon. Observation is usually done by reviewing, monitoring and examining an object, until it gets valid data [5]. So that observation can be interpreted as one of the data collection techniques that is more specific than other techniques [6]. Meanwhile, interviews can be defined as a data collection technique that is carried out in a structured or unstructured manner and can be conducted face-to-face or by using the telephone network[7]. In this study, the type of interview is an unstructured interview, because this type of interview is more flexible, with room for spontaneity. Unstructured interviews are open-ended, but still have to prepare a theme before conducting the interview[8].

The sample used in this study totalled 30 people[9]. Then the sampling technique used is the Accidental Sampling method, which is a technique for determining random samples. So whoever is encountered will be selected as needed and randomly without prior planning[10].

This research has novelty by using a combination of Kaizen Culture, Design thinking method and Quality Function Deployment in designing TransJakarta services to improve existing services.

The Kaizen Culture approach is defined as continous improvement. Key features of kaizen management include paying more attention to processes rather than results, cross-functional management and using quality circles and other tools to support continuous improvement[11].

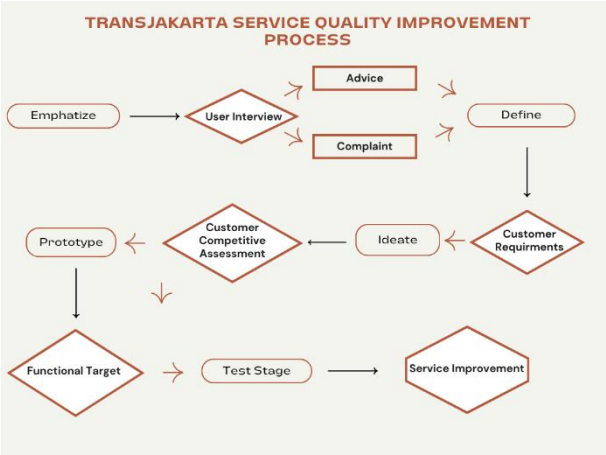
Design Thinking is a collaborative method that gathers ideas from many disciplines to come up with a solution. Design thinking not only focuses on what is seen and felt, but also focuses on the user experience. Design thinking is used to find the most effective and efficient solution to solve a complex problem. The approach with the Design Thinking method has five stages, namely [12]:

a. The first stage is Emphatize (Empathy) which is considered as a background in the design process. This stage seeks to understand users in the context of the service being designed, by conducting observations, interviews, and combining observations and interviews by first being given a scenario.
b. The second stage is Define, which is the process of analysing and understanding the various insights that have been obtained through empathy, with the aim of determining the problem statement as the point of view or main concern in the research.
c. The third stage is Ideate, which is the process of transitioning from problem formulation to problem solving, while in this ideate process will concentrate on generating ideas or ideas as a basis for making prototype designs to be made.
d. The fourth is Prototype, known as the initial design made to get responses from users to get design perfection.
e. Finally, the Test stage or testing is carried out to collect various user feedback from various final designs that have been formulated in the previous prototype process.

The next approach uses Quality Function Deployment which is translated into the House of Quality as a visual tool to implement the design of the Kaizen culture and Design Thinking Method. Quality function Deployment is a structured methodology used in the process of designing and developing products or services to determine the specifications of consumer needs and wants with the aim of increasing consumer satisfaction [13].

So the whole process of improving services on TransJakarta by using the Kaizen Culture, Design Thinking and Quality Function Deployment approach is depicted in Figure 1 which is.

Figure 1 TransJakarta Service Quality Improvement Process



3. Results and Discussions

The results of the data will be organised into stages of the combination of Kaizen Culture, Design Thinking and Quality Function Deployment as follows:

a. Emphatize

In this stage, researchers collected data from 30 TransJakarta users who provided information that there were several complaints about TransJakarta services which are arranged as follows:

Table 1 TransJakarta User Interview Results

Complaint	Advice
Lack of seating at bus stops	Expanding bus stops and increasing the number of seats
If it's after work, passengers are overcrowded on the buses	Adding officers who limit the number of passengers on the bus
Long response time to user complaints	Create Customer Care spots at each bus stop
Long bus waiting time	Increase the bus fleet
Difficulty in charging non-SOE payment cards	Cooperate with private payment cards
Frequent sexual harassment	Increase security officers to crack down on sexual harassment
Difficult to buy food and drinks when already inside the bus stop	Cooperate with minimarkets
Difficult to transfer to other public transport	Cooperate with other types of public transport
Too much transit activity	Increase alternative routes
Frequent congestion on routes that join public roads	Create independent lanes that are completely sterile from public vehicles

b. Define

In this stage, determining the point of view as an improvement to user complaints by giving weight to improvements in the House of Quality table.

Table 2 House of Quality (Customer Requirments)

Relative Weight	Customer Importance (1-5)	Maximum Relationship	Customer Requirements (Explicit and Implicit)
13%	5	9	Has a comfortable bus stop
13%	5	9	Limiting the of capacity on the bus
8%	3	9	There are customer care spots at each bus stop that are directly integrated into the TransJakarta service center
13%	5	9	Has a larger fleet of transportation
5%	2	9	Easier to fill out non-BUMN payment cards
10%	4	9	Add security officers to crack down on sexual harassment
3%	1	9	There is a minimarket spot in the bus stop
10%	4	9	Increase bus stops that are integrated with other public transportation
13%	5	9	Not too many transit activities
13%	5	9	TransJakarta lines are underground or flyover

From the table, there are 5 most desired user needs, namely:

a. Having a comfortable bus stop
b. Restriction of passengers in the bus
c. Having a larger fleet of buses
d. Not too many transit activities
e. The TransJakarta line is underground or flyover

Next, make an improvement plan for problems related to TransJakarta services. In designing the plan, it is necessary to establish the basic causes of the problem first. From the observation results, there are several causes of the accumulation of passengers on TransJakarta buses during working hours, namely:

a. Limited land to expand TransJakarta bus stops
b. Restriction of passengers can cause accumulation at TransJakarta bus stops
c. Adding a fleet of buses can incur large costs
d. To reduce transit activities, it is necessary to extend the bus route line
e. To build an independent lane in the form of an underpass or flyover, requires a large amount of money.

c. Ideate

In this stage, determining several alternatives that can be used as improvements to user needs which are the point of view in this study.
Some of the alternatives that will be used in this study use the advantages of competitors, namely:

Table 3 House of Quality (Customer Competitive Assessment)

Customer Requirements (Explicit and Implicit)	TransJakarta	Commuter line	JakLingko Public Transportation	online public transportation	MRT
Has a comfortable bus stop	3	3	1	0	4
Limiting the of capacity on the bus	1	1	5	5	3
There are customer care spots at each bus stop that are directly integrated into the TransJakarta service center	3	4	3	4	3
Has a larger fleet of transportation	3	2	2	5	3
Easier to fill out non-BUMN payment cards	3	3	1	0	3
Add security officers to crack down on sexual harassment	3	1	1	1	2
There is a minimarket spot in the bus stop	1	4	1	1	2
Increase bus stops that are integrated with other public transportation	2	3	2	1	2
Not too many transit activities	2	3	2	5	2
TransJakarta lines are underground or flyover	3	5	1	1	5

From this table, there are several advantages that can be used to improve service quality in TransJakarta, namely:

a. MRT transport has a more comfortable place to wait for passengers because it is designed to be more modern
b. JakLingko Public Transportation and online public transport have the ability to limit their users in using transport
c. Online public transport has a larger fleet because it has a greater range of cooperation with external parties.
d. Online public transport has the advantage of flexibility in use so that passengers do not need to make transit.
e. MRT and Commuter line have underground lines and flyovers.

4. Prototype

In this stage, a prototype is made which is a service improvement design that will be the basis for the House of Quality as a Part Target at the Functional Target, namely:

a. Modern bus stops
b. Ergonomic seating

c. Bus user limit 60 passanger
d. Addition of bus fleet
e. New, more flexible routes available
f. Underground or Flyover bus stops

5. Test stages

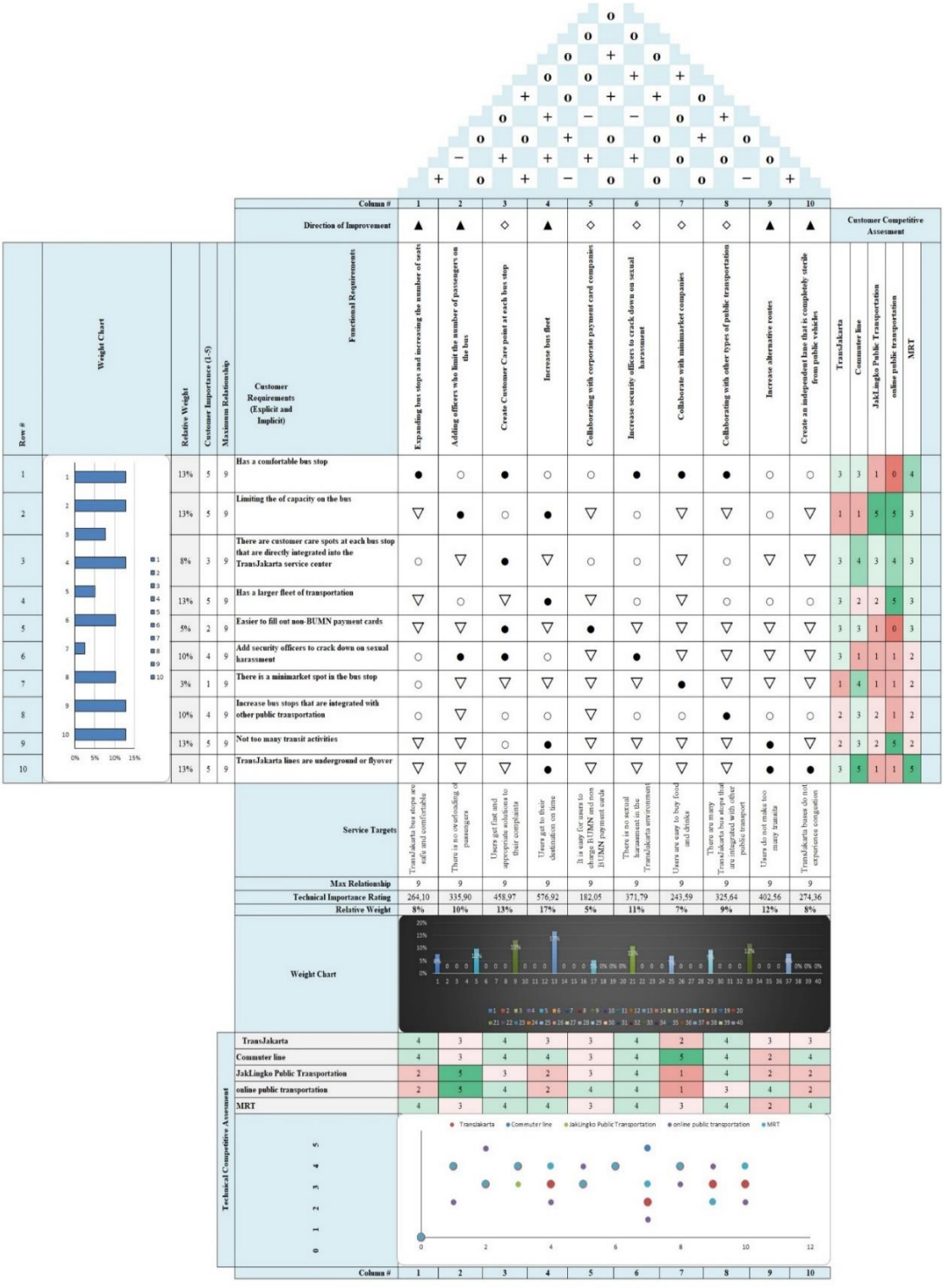
the test stage is the implementation of the design of improving the quality of Transjakarta services as outlined in the House of Quality.

From the results of user responses to the design of improving the quality of TransJakarta services, the results of services that are urgently needed for service improvement are that all TransJakarta bus stops are comfortable and there is no congestion when using TransJakarta buses.

After approaching the Kaizen culture and the Design Thinking Method, the next stage is to refine the design into the House of Quality so that the design can be measured and implemented into the research objectives.

The following is the level of customer functional target:

Figure 2 House of Quality (Customer Functional Target)
Source: https://drive.google.com/file/d/1qO4PHmKd8t1ICbLodasdKU4AHqBgz00i/view?usp=sharing



At this level, there are several Customer Requirements that need to be improved, namely:

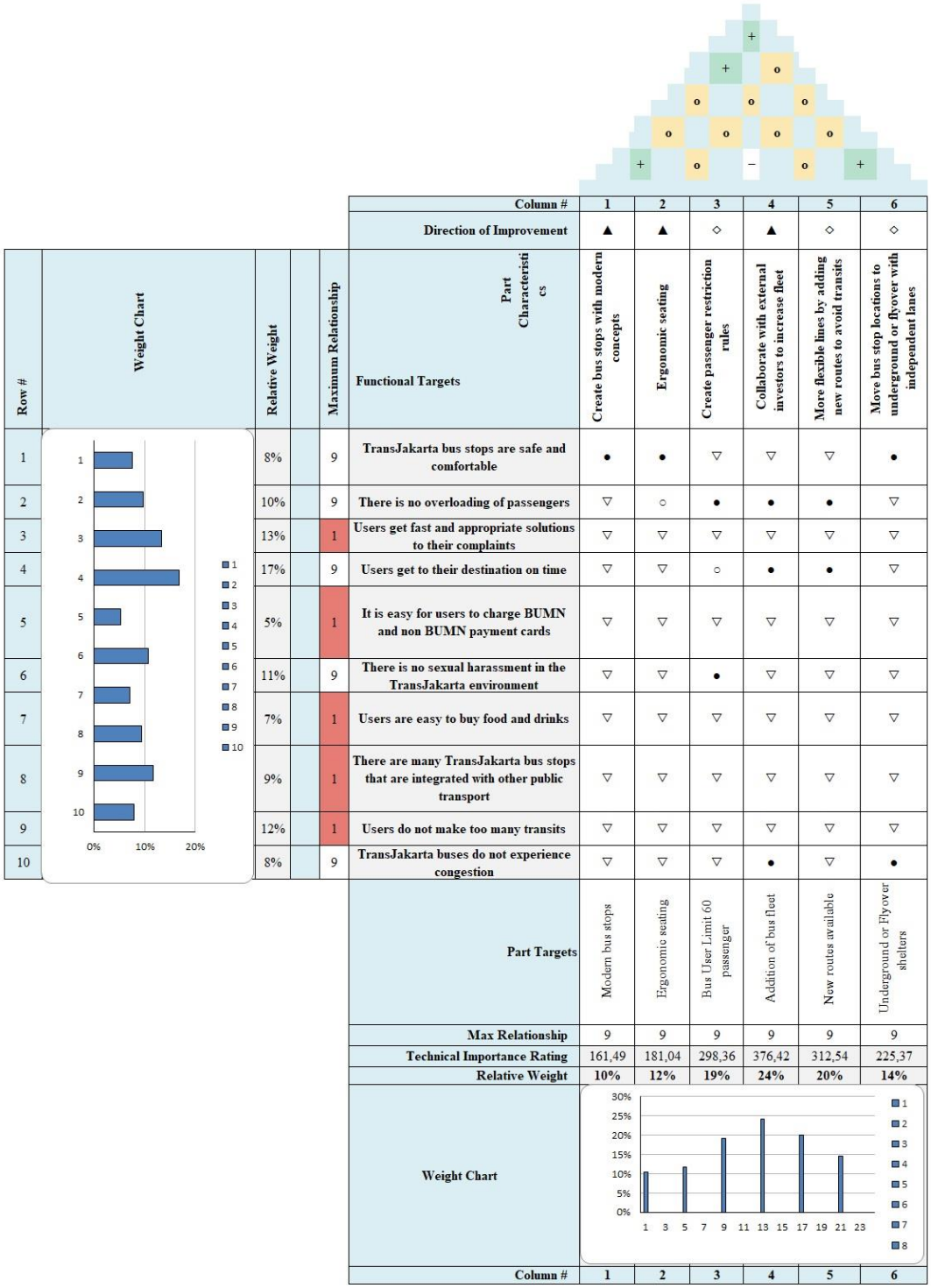
a. Expanding bus stops and increasing the number of seats
b. Adding officers who limit passengers on the bus
c. Increase the bus fleet
d. Increase the number of alternative routes
e. Creating an independent lane that is sterile from public vehicles

Then there is a comparison of services with several competitors. Services that need to be improved in order to compete with competitors are:

a. Number of users according to capacity
b. There are minimarket facilities at the bus stop
c. More bus stops integrated with other public transport
d. Reduction of transit activity

The next step is to convert the results of the Functional customer level into functional targets, namely:

Figure 3 House of Quality (Functional Target)
Source: https://drive.google.com/file/d/152n05dxLSikx9FkrxzOmu7FJpF-FOZNT/view?usp=sharing



Row #	Weight Chart	Relative Weight		Maximum Relationship	Part Characteristics / Functional Targets	Create bus stops with modern concepts	Ergonomic seating	Create passenger restriction rules	Collaborate with external investors to increase fleet	More flexible lines by adding new routes to avoid transits	Move bus stop locations to underground or flyover with independent lanes
					Column #	1	2	3	4	5	6
					Direction of Improvement	▲	▲	◇	▲	◇	◇
1		8%		9	TransJakarta bus stops are safe and comfortable	●	●	▽	▽	▽	●
2		10%		9	There is no overloading of passengers	▽	○	●	●	●	▽
3		13%		1	Users get fast and appropriate solutions to their complaints	▽	▽	▽	▽	▽	▽
4		17%		9	Users get to their destination on time	▽	▽	○	●	●	▽
5		5%		1	It is easy for users to charge BUMN and non BUMN payment cards	▽	▽	▽	▽	▽	▽
6		11%		9	There is no sexual harassment in the TransJakarta environment	▽	▽	●	▽	▽	▽
7		7%		1	Users are easy to buy food and drinks	▽	▽	▽	▽	▽	▽
8		9%		1	There are many TransJakarta bus stops that are integrated with other public transport	▽	▽	▽	▽	▽	▽
9		12%		1	Users do not make too many transits	▽	▽	▽	▽	▽	▽
10		8%		9	TransJakarta buses do not experience congestion	▽	▽	▽	●	▽	●
					Part Targets	Modern bus stops	Ergonomic seating	Bus User Limit 60 passenger	Addition of bus fleet	New routes available	Underground or Flyover shelters
					Max Relationship	9	9	9	9	9	9
					Technical Importance Rating	161,49	181,04	298,36	376,42	312,54	225,37
					Relative Weight	10%	12%	19%	24%	20%	14%
					Weight Chart						
					Column #	1	2	3	4	5	6

At the functional target level, the activity carried out is to make service targets as functional targets so that the design of TransJakarta service improvements becomes more specific. Functional targets at this stage are:

a. TransJakarta bus stops are safe and comfortable
b. There is no accumulation of passengers on the bus
c. Users get quick solutions if there are complaints
d. Users get to their destination on time
e. It is easy to charge BUMN or non-BUMN payment cards
f. No sexual harassment occurs
g. Easy to buy food and drinks
h. All bus stops are integrated with other public transport
i. Not too many transits
j. Buses do not experience congestion

Conclusion

The conclusions is Customer Requirment that needs to be improved expanding bus stops and increasing the number of seats, adding officers who limit passengers on the bus, increase the bus fleet, increase the number of alternative routes, and creating an independent lane that is sterile from public vehicles.

Then there is a comparison of services with several competitors. Services that need to be improved in order to compete with competitors are number of users according to capacity, there are minimarket facilities at the bus stop, more bus stops integrated with other public transport, and reduction of transit activity.

The quality of TransJakarta service will improve if the service target is in the following conditions TransJakarta bus stops are safe and comfortable if the bus stop concept is modern, ergonomic seating, and the location of the bus stop is underground or on a flyover with an independent route concept without mixing with public lanes. There is no accumulation of passengers on the bus because of the rules limiting bus capacity, adding fleets, and more flexible lines or adding new routes, Easy to charge BUMN or non BUMN payment cards, no sexual harassment occurs due to bus capacity limitation rules, easy to buy food and drinks, all bus stops are integrated with other public transport, not too much transit, buses do not experience congestion due to the addition of bus fleets and the location of bus stops underground or on flyovers with the concept of independent routes without mixing with public lanes.

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References

1. Wonga G, Utami AA. CUSTOMER SATISFACTION INDEX PENGGUNA BUS TRANS JAKARTA. 2020;6(4).

2. Nurlukman AD, Fadli Y, Nurhakim, Dzulham AS. Satisfaction Impact of Transjakarta Integrated Transportation System Quality Services. J Phys Conf Ser. 1 Maret 2020;1477(7):072014.

3. Kusumawardani R, Yenita Y. Pengaruh Kualitas dan Kepuasan Layanan terhadap Kepercayaan dan Loyalitas Pengguna Bus TransJakarta. J Penelit Sekol Tinggi Transp Darat. 12 Juni 2023;14(1):57–69.

4. Nababan HF. Menagih Perbaikan Layanan dan Jaminan Keselamatan Transjakarta [Internet]. Tersedia pada: https://www.kompas.id/baca/metro/2023/01/16/menagih-perbaikan-layanan-dan-keselamatan-transjakarta

5. Putri V. Observasi: Pengertian Para Ahli, Tujuan, Ciri-Ciri, dan Jenisnya. Tersedia pada: https://www.kompas.com/skola/read/2021/08/03/164904169/observasi-pengertian-para-ahli-tujuan-ciri-ciri-dan-jenisnya

6. Ismali MI. Evaluasi Pembelajaran: Konsep Dasar, Prinsip, Teknik, dan Prosedur. 2020.

7. Pengertian Wawancara, Tujuan, Jenis, Ciri, dan Cara Membuatnya [Internet]. Tersedia pada: https://penelitianilmiah.com/wawancara/

8. Wawancara Tidak Terstruktur: Definisi, Kelebihan, Kekurangan [Internet]. 2023. Tersedia pada: https://info.populix.co/articles/wawancara-tidak-terstruktur/

9. Sampel Minimal 30 Menurut Sugiyono [Internet]. Tersedia pada: https://www.menurut.co.id/sampel-minimal-30-menurut-sugiyono

10. Metode Accidental Sampling: Cara dan Contoh [Internet]. Tersedia pada: https://deepublishstore.com/blog/metode-accidental-sampling/

11. Indrajaya MH, Fathoni A, Minarsih MM. PENGARUH BUDAYA KAIZEN TERHADAP KINERJA KARYAWAN DENGAN SELF EFFICACY SEBAGAI VARIABEL MODERATING (STUDY IN PT. DJARUM UNIT SKT KRADENAN KUDUS). J Manag. 2016;2.

12. Razi AA, Mutiaz IR, Setiawan P. PENERAPAN METODE DESIGN THINKING PADA MODEL PERANCANGAN UI/UX APLIKASI PENANGANAN LAPORAN KEHILANGAN DAN TEMUAN BARANG TERCECER. Desain Komun Vis Manaj Desain Dan Periklanan Demandia. 28 September 2018;3(02):219.

13. Km JK. QUALITY FUNCTION DEPLOYMENT. 2013;