

Pieces Analysis: Means To Analyze The Satisfaction Of Transport Users In The City Of Malang

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Abstract: Malang City is one of the cities in East Java that has public transport with a very dense population, Malang City Transportation Department data records that there are around 2,192 total city transportation and not to mention the Taxi and online transportation fleets operating in the Greater Malang area. Problems that need to be considered in public transportation in Malang, especially city transportation, are confusion among the public in finding a schedule through proper transportation, waiting in the rain, heat and traffic jam and users waiting on the side of the road, but transportation does not necessarily pass. Efforts to improve this have begun to be done by balancing between the desires of the people, the development and demands of information technology and increasing revenue of urban transportation by designing an online-based Malang city transportation system. However, the issue of the relevance of information and the feasibility of the existence of an online city transportation application still needs to be assessed as to how much this need exists in the community. This is what underlies the study of this study. The purpose of this study was to determine the Comparison of Information Systems Quality and Transportation Facilities in Malang City with the Pieces Framework Approach by looking at the feasibility of making plans for Android-based transport applications from various aspects conducted online. This research method is to analyze all public transportation services or providers with the PIECES method (Performance, Information, Economic, Control, Efficiency, Service). From the results of the study concluded that the average of all transportation has the same economic parameters namely the costs incurred in accordance with the benefits received. While other parameters (efficiency, performance, information, control, service) there are significant differences in the performance of vehicles and drivers, vehicle, driver and company information as well as the services provided. The urgent thing to be addressed in stages is performance, efficiency and information on angkot, where in the current millennial era the need for fast and precise information is needed so that it can make recommendations for observers of angkot, academics, angkot owners and the government to be able to pay attention to the existence of angkot by assisting in the making of the Malang City Angkot application so that Angkot is used for school children, college students can by providing a minimum of accurate information about its whereabouts when needed besides gradually other parameters are also improved.

Index Terms: Information Systems, Quality and facilities, land transportation, PIECES

1. INTRODUCTION

Transportation is one of the most important elements in the economy, because transportation is very closely related to community activities, especially people in urban areas. Without transportation, community activities or activities will be disrupted. Public transportation is one of the types of transportation facilities that are most widely used by the community everyday, because the costs are relatively cheap and affordable by most people. Malang City is one of the cities in East Java which has public transportation with a very dense population. The problem that needs attention in public transportation in Malang is the confusion of the public in finding a schedule through the right transportation, waiting in the rain, heat and traffic and users waiting on the side of the road, but transportation is not necessarily passing. On the other hand, transportation is also used to going slowly if the transportation is empty and the road is in a hurry if the transportation is in full condition. The lack of information regarding the exact schedule of public transportation routes in the city of Malang has caused public transportation users to start moving to new transportation, namely online taxis. The existence of an online taxi actually answers the challenges of the development of information technology and the needs of

the community, but its existence is a dispute for transport managers and drivers who ultimately lead to demonstrations, fights and tragic to the point of murder. To overcome and compensate for this conventional transportation it is time to innovate in terms of the position of transportation that can be seen by the transport user so that all the problems that have been conveyed can be overcome. The innovation that will be made is by designing Conventional Public Transportation Information System in Malang based on online. The purpose of this study is to look at the feasibility of plans to make android-based transportation applications from various aspects that are done online. To achieve the research objectives, it requires a comparative analysis method between several public transportation operating in Malang with the PIECES method. This research uses a quality approach and facilities so that the study uses a qualitative approach. The PIECES method is a useful framework for the classification of problems, opportunities and the direction of change in information systems. The unit of analysis is: Public transport users. The sample frame is based on purposive sampling. The research instrument used questionnaires and in-depth interview techniques.

2 LITERATUR REVIEW

2.1 Information System

An information system is a group of components forming a system that has a link between one component and other components that aim to produce information in a particular field [1][2]. In information systems the classification of information flows is needed, this is due to the diversity of information needs by information users. The criteria of the information system, among others, are flexible, effective and efficient. Information systems can also be defined as a system

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within an organization that is a combination of people, facilities, technology, media procedures and controls aimed at obtaining important lines of communication, processing certain types of routine transactions, giving signals to management and others towards internal and external events that are important and provide a basis for information for decision making.

2.2 Transportation and Public Transportation

Transportation is defined as the transfer of goods and people from the place of origin to the destination. The transportation process is a movement from the place of origin, from where the transport activity begins, to the destination, where the transportation activity is ended [3][4][5]. And according to [6], transportation is the activity of moving goods (cargo) and passengers from one place to another. The elements of transportation include: 1) People in need, 2) goods needed, 3) vehicles as tools / facilities, 4) roads and terminals as transportation infrastructure and 5) organizations (transportation managers) Transportation is a means to move people or goods from one place to another. The goal is to help people or groups of people reach various places they want, or deliver goods from their place of origin to their destination. The process can be done using transportation facilities in the form of vehicles or without vehicles (transported by people). Public Transportation is passenger transportation carried out with a rental or pay system. Included in the definition of passenger public transportation are city transportation (bus, minibus, etc.), train, water transportation and air transportation [7]. The basic purpose of providing public transportation, [8][9] says is to provide good transportation services - reliable, comfortable, safe, fast and cheap, for the public. In general, it can be said that public transportation is always unable to compete with private vehicles. From several studies on public transport [10][9] states that public transport services can be sought approaching private transportation to make public transportation more attractive and private transport users interested in moving to public transportation. This can be measured relative to service satisfaction several ideal public transport criteria, among others is :

TABLE 1
IDEAL PUBLIC TRANSPORTATION CRITERIA

Reliability	Convenience
At any time available, Arrival and arrive at the destination on time, Total short trip time - from home, waiting, on vehicle, walking to destination, Short waiting time, Little walking to the bus stop, No need to switch vehicles.	Courteous service, Protected from bad weather at the bus stop, Easy riding and riding vehicles, Available seating at all times, No crowding, Attractive interior, Good seating.
Security	Cheap
Avoiding accidents, the body is protected from impact injuries, Free from crime.	Affordable, inexpensive fees.
Travel time	
Time in a short vehicle	

Source : M. L. Manheim, processed (1976)

2.3 Pieces Analysis Method

According to [11], the PIECES method is a method of analysis as a basis for obtaining more specific issues. In analyzing a system, it will usually be carried out on several aspects including performance, information, economy, application

security, efficiency and customer service. This analysis is called PIECES Analysis (Performance, Information, Economy, Control, Efficiency and Service). PIECES analysis is very important to do before developing an information system because in this analysis usually will be found several major problems and problems that are symptomatic of the main problem [12][13][14]. This method uses six evaluation variables, is :

- Performance : Performance is the first variable in the PIECES analysis method. Where has an important role to assess whether the process or procedure is still possible to improve its performance, and see to what extent and how reliable an information system is in processing to produce the desired goals. In this case performance is measured from: 1) throughput, i.e. the amount of work / output / deliverables that can be done / generated at a certain time., 2) response time, i.e. the time needed to complete a series of activities to produce certain outputs / deliverables.
- Information (information): Assess whether existing procedures can still be improved so that the quality of information produced is getting better. The information presented must truly have useful value. This can be measured by: 1) Outputs: A system for producing output. 2) Inputs: In entering a data so it is then processed to become useful information.
- Economic: Assess whether the existing procedures can still be improved (useful) or reduced the cost of implementation.
- Control: Assess whether existing procedures can still be improved so that the quality of control is getting better, and its ability to detect errors / fraud is getting better too.
- Efficiency: Assess whether the current procedure can still be improved, so that an increase in operating efficiency is achieved, and it must be superior to the manual system.
- Service: Assess whether existing procedures can still be improved by their ability to achieve improved service quality. Make the quality of service very user friendly for end-users (users) so that users get good quality service.

3 RESEACRH METHODS

This type of research uses qualitative exploration methods. The research location is in Malang Raya. Informants are people who have used public transportation. The study population is all people who have used public transportation. Because the population is unknown then in an effort to get a sample size, in this study based on opinions [15] which suggest a sample size of 5 to 10 for each indicator used. The number of indicators in this study is 25 indicators, so the number of samples that can be taken between samples up to 125 samples. The maximum number of samples determined is $25 \times 5 = 125$ respondents. The type of data used in this study is quantitative data, that is data expressed in the form of figures that can be calculated. In this study included in quantitative data is the result of filling out the respondent's questionnaire. The data sources used in this study are primary data and secondary data. Processing qualitative data analysis through stages: Data reduction, data presentation, and drawing conclusions (verification).

4 RESEARCH RESULT

PIECES aspects consist of Performance, Information,

Economy, Control, Efficiency, and Service. Comparison User Perception of Public Passenger Transportation System in Malang City Based on PIECES Aspects in this study was measured by a questionnaire instrument consisting of 25 question items with a score of 1 to 5. Following is an explanation of each aspect of PIECES along with the distribution of questionnaire results and their averages and perceptions, as in the following tables:

TABLE 2
PERFORMANCE ASPECTS

No	Component	Taxi	Public transportation (Angkot)	Grab Car	Go Car
1.	Pickup speed	2.61	1.30	5.00	4.70
2.	Vehicle cleanliness	2.30	1.30	4.30	4.30
3.	Comfortable (new) car	2.30	1.39	4.39	4.39
4.	Driver appearance	2.30	1.30	3.70	3.70
Average		2.38	1.33	4.35	4.27

Source: Primary data, processed (2019)

Based on Table 2 it is known that the performance aspects consisting of pickup speed, vehicle cleanliness, new cars and the appearance of the driver what is the largest average value on the Grab Car is 4.35 (very good tendency) and the lowest average performance is on transportation of 1, 33. (very bad tendencies). This can be understood because the grab car includes the category of online transportation that car specifications, pickup speed and the appearance of a standardized driver is different from the transportation that is very contradictory.

TABLE 3
ASPECTS OF INFORMATION

No	Component	Taxi	Public transportation (Angkot)	Grab Car	Go Car
1	There is a driver profile	2.70	1.00	5.00	5.00
2	There is a company p	2.70	1.00	4.61	4.61
3	A definite price	2.30	4.30	5.00	5.00
4	Timeliness information arrived	1.00	1.39	5.00	4.70
5	Pick up time information	3.30	1.00	5.00	5.00
6	Car type and number information	2.91	1.39	5.00	5.00
Average		2.49	1.68	4.93	4.93

Source: Primary data, processed (2019)

Based on Table 3 it is known Aspect of Information which consists of a driver profile, company profile, exact price, punctual arrival time, pick up time accuracy and type information as well as car number what is the biggest average value on Grab Car of 4.93 (very good leads) and the lowest average information is on transportation of 1.68. (bad tendencies). This can be understood because as an application-based transport car grab and go car must make passenger confidence increase by providing driver and company profiles and determining the exact price based on distance, this is contrary to conventional transport where passengers do not know the driver's profile and when arrived because the transport is not a passenger vehicle carrying one

or several passengers at the same time, but with a different time.

TABLE 4
ECONOMIC ASPECTS

No	Component	Taxi	Public transportation (Angkot)	Grab Car	Go Car
1	Costs incurred in accordance with the benefits received	2.00	3.78	4.70	4.70
2	Costs incurred and services are appropriate	1.39	3.39	4.70	4.70
3	The existing system so far can still be developed	3.39	4.09	4.39	4.39
Average		2.26	3.75	4.59	4.59

Source: Primary data, processed (2019)

Based on Table 4 it is known that the economic aspects consisting of costs incurred in accordance with the benefits received, costs incurred and the existing system so far can still be developed what is the largest average value on Grab Car and Go Car of 4.59 (leads very well) and the lowest average economic aspect is the taxi of 2.26. (good tendency). This can be understood because the grab car and go car as an online transportation application system continue to develop themselves to continue to cross in the field of transportation and other systems outside transportation. In terms of the costs incurred by the economic aspects that are felt by the public are reasonable and reasonable costs incurred with the benefits that are felt both from online transportation or conventional transportation.

TABLE 5
CONTROL ASPECTS

No	Component	Taxi	Public transportation (Angkot)	Grab Car	Go Car
1	Consumer protection	3.39	2.70	4.61	4.30
2	There is a driver control form and conditions during service	2.09	1.00	5.00	5.00
3	Driver evaluation	1.00	1.00	5.00	5.00
4	Pick up time control	2.30	1.00	5.00	5.00
Average		2.2	1.42	4.9	4.83

Source: Primary data, processed (2019)

Based on Table 5 it is known that the control aspect which consists of protection of consumers, the existence of a driver control form, driver evaluation and control when picking up the largest average value of Grab Car is 4.9 (very good leads) and the lowest average control aspect is on transportation of 1.42. (bad tendencies). This can be understood because as a new transport-based grab car application requires improvements in the existing pickup and driver system so that it is expected to continue to exist in the existing transportation system. This is in contrast to conventional transportation where there is no driver control sheet while carrying out services to consumers.

TABLE 6
EFFICIENCY ASPECTS

No	Component	Taxi	Public transportation (Angkot)	Grab Car	Go Car
1	Speed of time to get orders (reduce waiting time)	3.09	1.39	4.70	5.00
2	Can place orders anywhere	4.09	1.00	5.00	4.70
3	Whenever you can order (24 hours)	3.30	1.00	5.00	4.70
4	Can choose a vehicle that suits the passenger capacity	2.30	1.00	5.00	5.00
Average		3.2	1.1	4.92	4.85

Source: Primary data, processed (2019)

Based on Table 6, it is known that the efficiency aspect of the largest average value on Grab Car and Go Car is 4.92 (very good leads) and the lowest average efficiency aspect is on transportation of 1.1. (very bad tendencies). This can happen because in using passenger transportation it is not possible to choose the vehicle according to the wishes of the passengers but in accordance with the lanes and vehicles that have been dating and specified, in addition to that for passenger transportation also cannot predict when the transportation will pass or pickup will arrive so passengers must be willing to wait patiently, this is very different from transportation where passengers can know clearly and definitely the position of the car that will be coming or picking up.

TABLE 7
SERVICE ASPECTS

No	Component	Taxi	Public transportation (Angkot)	Grab Car	Go Car
1	There are contact numbers for drivers and companies	3.52	1.00	5.00	5.00
2	Customer service	4.30	1.00	4.70	4.70
3	Driver's friendliness	3.00	3.30	4.70	4.70
4	Ease of access to services (application use)	3.70	1.00	5.00	5.00
Average		3.63	1.58	4.85	4.85

Source: Primary data, processed (2019)

Based on Table 7, it is known that the service aspects consist of contact drivers, complaint center, driver friendliness and ease of access to services, what is the biggest average value on Grab Car and Go Car of 4.85 (very good leads) and average service aspects The lowest is in transportation of 1.58. (bad tendencies). This can be understood because the grab car and go car as a public transportation system online must indeed have a communication system between the driver and passengers and passengers can provide complaints about the services provided by the driver. This is very different from the system used by public transportation.

5 IMPLEMENTATION

Conventional transportation is a type of service. Which is currently, a public transportation service provided by the government that results in this study are still found many

deficiencies and do not even consider the pattern of community development so that it can not meet the quality expected by the community. This opportunity is seen by businesses to provide transportation for people who do not have a vehicle or people who need time efficiency by riding public transportation. This opportunity that was seized by online transportation services made by businesses that are popular today is transportation services based on online applications that use the internet, this is very influential for the public in all activities quickly and efficiently. The public as users certainly expect the presence of a good quality public transportation system, even the existence of such transportation is not only for moving people but something more like the movement of goods such as food and other goods. This is in accordance with research conducted [16] about the existence of gofood on culinary in Malang, where in working on the market owned by the millennial generation there must indeed have a breakthrough in the field of technology and communication. To hook the millennial market and keep up with the times, the existence of transportation must be renewed starting from the availability of the fleet in accordance with the number of passengers, the quality of transportation that is able to provide comfort, clear and easily obtainable information services, and timely travel time is a general description of people's expectations concerning the ideal transportation system that should have been implemented by the government and conventional transport managers [17]. This is consistent with the opinion [18] which says that conventional transportation occurs because it is influenced by factors driving unplanned change, because the presence of online transportation causes a lot of turmoil from various parties, such as service users, the government, and online transportation. To overcome this the government and managers of conventional transportation services should conduct a study related to the public transportation system and improve regulations. Furthermore, conventional transportation should be able to increase the latest innovations and increase knowledge of public transportation applications. The business culture built by taxis and online transportation does look more professional compared to conventional transportation which has long played in the domestic transportation market. It cannot be denied that the public interest in taxi and online transportation is very high. The great interest of the community towards taxi and online transportation services indicates that there has been a shift in preferences for modes of transportation from conventional forms to digital based transportation. On this basis after this PIECES study, the author tries to help make a special application for conventional transportation in order to balance some of the needs of the conventional transportation community by providing recommendations for making special applications of conventional transportation. With this application, there is a minimum waiting time problem, the accuracy of passenger pickup can be met so that the principles of efficiency and effectiveness of transport users can be met.

6 CONCLUSION AND RECOMENDATION

6.1 Conclusion

1. Performance Aspects: Grab car and go car are included in the category of online transportation, the specifications of the car, pickup speed and appearance of the driver that have been standardized are different from the

transportation which is very contradictory.

2. Information Aspect: As an application based car grab car and go car must make passenger confidence increase by providing driver and company profiles and determining the exact price based on distance, this is contrary to conventional transport where passengers do not know the driver's profile and when arrived because the transport is not a passenger vehicle carrying one or several passengers at the same time, but with a different time.
3. Economic aspects: Grab car and go car as an online transportation application system continue to develop themselves to continue to cross in the field of transportation and other systems outside transportation. In terms of the costs incurred by the economic aspects that are felt by the public are reasonable and reasonable costs incurred with the benefits that are felt both from online transportation or conventional transportation.
4. Control aspects: as a new transport-based grab car application requires improvement in the existing pickup and driver system so that it is expected to continue to exist in the existing transportation system. This is in contrast to conventional transportation where there is no driver control sheet while carrying out services to consumers.
5. Efficiency aspects: In using passenger transportation, it is not possible to choose the vehicle according to the wishes of the passengers, but in accordance with the lanes and vehicles that have been dated and specified, in addition to passenger transportation, it also cannot predict when transportation will pass or pickup will arrive so that passengers must be willing to wait patiently, this is very different from transportation where passengers can know clearly and surely the position of the car that will come or pick up.
6. Service aspects: Grab cars and go cars as online transportation system must indeed provide more high service because the costs incurred by passengers are also very large when passengers use transportation, in addition there is also a communication system between the driver and passenger and passengers can provide complaints against services provided by the driver. This is very different from the system used by public transportation.
7. The amount of public interest in taxi services and online transportation indicates that there has been a shift in preferences for modes of transportation from conventional forms to digital based transportation.

6.2 Recommendation

Broadly speaking, we can see that there are still many challenges faced by conventional transportation. Both in terms of quantity and quality of these modes of public transportation. Some homeworks that must be faced are how to effectively wait for transportation and for drivers not to run their vehicles slowly or in a hurry, reduce the number of security disturbances in the administration of public transportation, improve service performance, improve the competence of transportation human resources and also improve the quality of supervision performance in this public transportation sector. From the results of a comparative analysis of existing transportation it can be seen how conventional transportation in maintaining its existence amid the existence of Taxi and

online transportation does have to adjust to the changing times to continue and be able to survive in the millennial era. The existence of transportation is still very much needed by the public, considering that transportation is a means of transportation that is cheap, lively and mass, this reason being conventional transportation can survive in the midst of the onslaught of online and taxi transportation. For reasons of mass and cheap transportation, facilities and infrastructure must not be neglected. The improvement of transportation facilities and facilities needs to be improved such as: vehicle cleanliness, age of the car and minimizing the length of the passengers waiting for transportation. In addition to this, the need for applications that support conventional transportation also naturally exists in the community to strengthen the principle of effective and efficient for transport passengers and drivers.

ACKNOWLEDGMENT

This research was supported by the Ministry of Research and Higher Education technology of the Republic of Indonesia

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