The Characteristic of Online Transportation Services and Provision in Semarang City

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Abstract: The complex mobility in Semarang city requires the efficient and effective provision and services of public transportation. Because the condition of public transportation services is not proper, it requires the presence of online transportation. Online transportation services have a flexibility (in routes and time) and it seems the society has their own private vehicles. Online transportation prices is more expensive than private vehicles or public transportation. However, it provides flexibility and convenience as one of the alternative transportation mode. Therefore, in order to create maximum service for online transportation, it is necessary to know about the characteristics of service patterns in terms of drivers or providers of online transportation in the city of Semarang. Based on this, the research question was formulated as follows, "How is the Supply and Pattern of Online Transportation Services in the City of Semarang?" There are four things that need to be considered in this study, namely provision, ordering mechanism, cooperation mechanism, and service pattern. The method used in this study was descriptive statistics and crosstab. The results of this study showed an overview of the provision and services provided by online transportation. Services provided by online transportation providers. Based on the results of the questionnaire, online transportation serves school children in the morning peak hours (31%) and workers in the afternoon peak hours (22%). Online transportation is not only as feeder or feeder but can already be referred to as urban transport, it can be seen that 48% travels 6-10 km where the distance is classified as medium distance (above 5 km). Online transportation largely serves the movement of people from residential areas to activity centers such as education, offices and industry. Meanwhile, in the afternoon, the community is moving from the center of activity to resettlement.

Keywords: choices of mode, supply, services, online transportation

INTRODUCTION

The growth of activity in the regional or city area would affect the needs of transportation mode. Rapid population growth will affect the mobility of logistic and people that cause transportation problem. Minimum number of public transportation is one of the crucial problem in Semarang City. High demands of mobility and space in Semarang City and surrounding area (including small cities), is proved by high land use intensity in the City [1].

The lack of public transportation is easily indicated by the quality of services. The routes of public transportation offer inflexible services because they only pass into certain routes, and not all of the people can access those routes easily. This will be the biggest motive to people using private vehicles [2]. Online and private transportation actually have an easy automobile access, which provides another alternative mode. Online

transportation, which is also called a ridesharing, might decrease the volume of vehicles. So, online transportation has a similarity with ridesharing or ride-sourcing concept [3].

Online transportation is a high technology applied to transportation sector. The online transportation service is related to its supplier. The easiness and services of online transportation are one of the reason why people leaving conventional transportation (public transportations). The advantages of online transportation are the clear information about the price and dwelling time for the user. Online transportation also offers online order via smartphone without the users go to the traditional taxi bike station [4]. Online transportation also provides two ways of pay: cash or non-cash. Online transportation also attempts to provide security and convenience to the users. Reported by the Kompas Newspaper and the result of the Puskakom UI research [5], 95% of the users feel secure and 98% feel comfortable by using the online transportations.

Semarang has about 1,653,035 people [6]. Therefore, it is categorized as the metropolitan city. Rapid growth of population might cause the high mobility in Semarang urban society. The existence of online transportation gives impact to the decreasing of public transportation users and also gives a practical solution of traffic congestion [7]. There is a performance disparity between online and public transportation. Online transportation provides relatively better services than public transportation for these following reasons: online transportation is operating on free routes and 24 hours services. On the contrary, public transportation is determined by the government rules and it only operates from morning until afternoon.

According to the services condition, the purpose of this study is "how is the online transportation performance in Semarang". The indicators of the service could be seen by the number of vehicles and services of online transportation in Semarang. This study provided the description about the provision and services on online transportations in Semarang city. Based on [8] stated that performance services of transportation mode are measured by: the size of the vehicle, the average of dwelling time and the length time of trip. In the research, we know that the dwelling time and trip of online transportation is better than conventional transportation. The dwelling time of online transportation is 5.6 to 6.9 minutes. However, the conventional transportation is 6.2 to 9.6 minutes.

Online Transportation

Online transportation or ride – sourcing can be operated through a smartphone application. The driver of ride – sourcing is intentionally get the profits. This mode is different with the taxi, while the drivers of ride – sourcing use their own vehicles to serve the customers. Therefore, the company does not need to provide the investment cost and automotive insurance [3].

The ride – sourcing users are able to choose the pick – up locations, their destinations, as well as to choose the type of transportation mode through the applications. The operator will automatically match the users and the closest driver. This might reduce the waiting time and the pick-up cost for the driver. The drivers who receive the orders are informed about the location of the pick – up point through navigation system. The passengers get the information about the length of time of the vehicle arrival. When the ride – sourcing is done, the passenger does not necessarily pay in cash or negotiate about the cost with the driver. The fare is fixed as stated in smartphone and it can also be paid through application. The data of the passenger and the driver, as well as the trip history are saved in the application, it gives benefit to decline crimes and facilitate the conflict between two parties [9]. Besides that, for some platforms like Uber, Gojek and Grab, they provide rating feature or evaluation both for the driver and the passenger. This evaluation affects the usage of the application in the future. The feature makes the ride – sourcing as one of the distinguished mode, comparing with taxi or ride – sharing which does not intend to get profit.
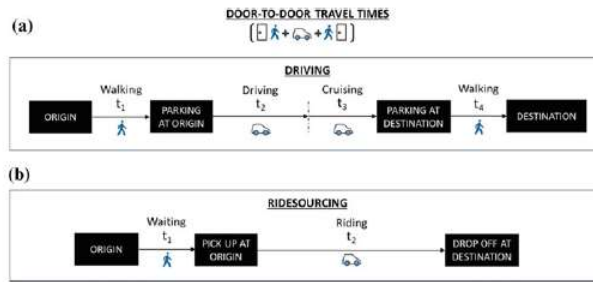
Fig. 1 Door-to-door travel times. a Driving. b Ridesourcing

FIGURE 1. Different Time of Driving and Ride - Sourcing Travel

Based on the **Figure 1**, we know that the trip time of ride – sourcing is shorter than self-driving. When people choose driving by themselves, it takes a longer time because they need to find the parking space and walk to the destination. It is different with the ride – sourcing. They just need to wait for picking-up without thinking about parking space and walking to the location, since the passengers are dropped at the closest location.

The easy internet access provides a chance for people to conduct an online transaction. This chance is taken by transportation sector [10]. The usage of technology provides many benefits for people to access online transportation services. In the last few years, there have been many transportation service business based on applications or online [11].

According to [12], online transportation is one of the services which provides information about the length of time for the driver arrival. Based on the above definition, we can conclude that online transportation is one of the mobility solution that simple, convenience, faster, and cheaper.

Provision Concept/Transportation Supply

According to Kanafani in [16], the concept of transportation supply explain the rate of transportation system services provided by the suppliers. However, according to [14], there are three parts of analyses of offering/transportation supply. They are:
1. Quality control, the supervision towards the age of the vehicle and vehicle appearance.
2. Quantity control, the supervision towards the amount of transportation mode based on requested analysis.
3. Economic control, the tariff regulation based on the cost of the supplier analysis and their income to create the fairness prices.

Transportation Services

The ideal transportation must be effective and efficient. According to [15], the effective and efficient transportation has eight good services quality, such as smooth, safe, flexible, reliable, cheap, comfortable, capacity and easy. The transportation services aim to fulfill those eight points of quality. There is a difference of capacity measure in online and public transportations. In public transportation, the capacity is based on the amount of passengers per hour. However, online transportation is based on the amount of passengers in a day. The payment of online transportation is more flexible, since the suppliers give options whether pay with cash or non-cash. Moreover, the online transportation is easily ordered using smartphone applications all the time and everywhere.

Public Transportation

According to [16], public transportation is transportation mode for many people. Passenger pays the fare based on the tariff and distance. However, people who use public transportation do not need to consider about maintenance cost and fuel. The characteristics of public transportation mode are below:

1. The users should adjust with the determined origin and destination route.
2. The origin and destination routes are fixed and regulated with the rules.
3. The public transport halt are also determined by the route rules and public operators rules. The examples of public transportations are: Pedicab, taxy, cab, public car, bus, train, aero plane, etc.

METHODOLOGY

The methods of this research is descriptive quantitative method. This method is to explain the research object thoroughly. This research is to notify the characteristics of online transportation provisions and services in Semarang City. In this research, the variables are service area and provision of online transportation. The service area explains about which areas are served by the transportation and supported by the land use of Semarang City. These are divided into three categories: high, moderate and low. The provision explains the distribution of drivers, the users at peak hours (morning and afternoon), as well as the trip destination.

Sampling method was non – probability sampling. In this study, the respondents consisted of the drivers of online transportation in Semarang. Although the sampling process was performed accidentally, they had to fit with the requirements. For example, the drivers are the ones who served the people in Semarang. Approximately 100 respondents were required to this study.

The survey areas in this research included: Kecamatan Pedurungan (Pedurungan Sub-District), Kecamatan Semarang Tengah (Semarang Tengah Sub-District), and Kecamatan Tembalang (Tembalang Sub-District). The reason of those area is land use: Kecamatan Pedurungan is a settlement area, Kecamatan Tembalang is an educational area (university), and Kecamatan Semarang Tengah is an urban center of Semarang.

RESULTS AND DISCUSSION

The Identification of Online Transportation Service Charateristics

Online transportation is one of the transportation types. Online transportation serves the customers 24 hours (non-stop) anytime and everywhere. The benefit of online transportation is not only for its order but also in the two kinds of payment, cash and non-cash.

Online transportation serves various purposes such as schools, campuses, offices, and shopping malls area. At the morning peak hours, the main users consisted of students (31%) and at the afternoon peak hours are employees (22%). Online transportation served 16 sub-district (kecamatan) in Semarang City, from sub-urban to the city center.

Online transportation serves the various distance, from the short trip (1-5 km), middle trip (6-10 km), and long trip (11-20 km). It shows that online transportation is not considered as a feeder. However, it is also as a door to door public transportation. This characteristics makes the people in Semarang switch from public transportation to online transportation, because public transportation is not flexible.

The Characteristics of Online Transportation Mobility in Semarang City

The public transportation route in Semarang city only cover the main road corridor and it does not reach the settlement areas or sub urban. This situation make users tend to choose online transportation with the main reasons faster and flexible, and that affects to the mobility. Online transportation serves from the city center to sub urban area or vice versa. Below is the percentage of the destination trip of online transportation:
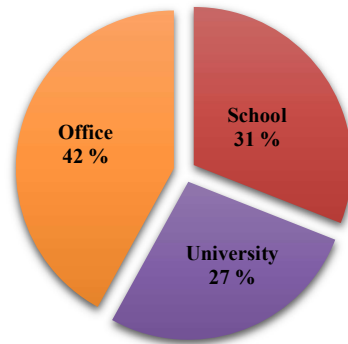
FIGURE 2. Destination of Online Transportation in Semarang City (in percentage).

The highest mobility to the city center was found on Semarang Tengah and Semarang Selatan. This phenomenon also occurred in education area such as Tembalang. The mobility is mostly from the settlement/dormitories to the Campus. The mobility is also quite high to the housing land use as in Kecamatan Pedurungan, Kecamatan Banyumanik, Kecamatan Semarang Timur and Kecamatan Semarang Barat.

The survey results showed that: 19% to Kecamatan Semarang Tengah, 11% to Kecamatan Tembalang, and 9% to Kecamatan Semarang Selatan and Pedurungan. Semarang Tengah (the city center of Semarang) has various activities like schools (SMA 3 and SMA 5, etc), business and services (Ciputra Mall and hotels). Meanwhile, Kecamatan Tembalang is education function area in Semarang city, where there is a State University, UNDIP (Diponegoro University). Kecamatan Semarang Selatan is strategic offices province area and Kecamatan Pedurungan has a mixed function like industrial area (PT SAI Apparel, factories) and settlement area.
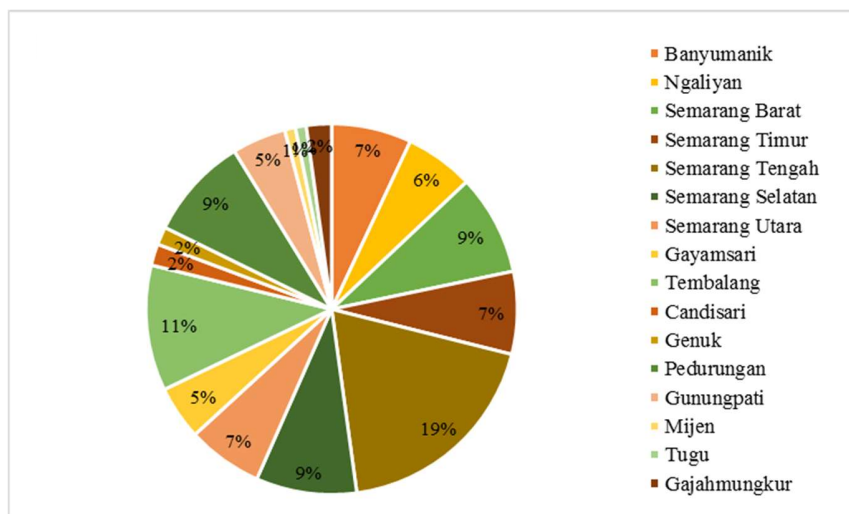

FIGURE 3. Mobility of Online Transportation in sub-districts in Semarang City (in percentage).

The Characteristic of Online Transportation Services in Semarang City

Services area is an area that people could use transportation services in the needs of the mobility from origin point to destination point. Online transportation in Semarang City has provided all of the sub-district services in Semarang. Each sub-district in Semarang City has a different online transportation services demand. The demand rate could be seen from the results of the questionnaire about the most area that order online transportation frequently. Online transportation driver serve from settlement area into school, university, and offices area in the morning.

Meanwhile in the afternoon, online transportation driver serve from the center activities such as offices area to settlement area. Thus, online transportation driver services is influence by land use area.

Sub – districts which are dominated by land use of settlement area affect to the high demands in online transportation to land use of education, offices and industrial area. Sub – districts which were highly occupied land use of settlement area and have high service order are: Tembalang, Banyumanik, Pedurungan, Semarang Utara, Semarang Barat and Ngaliyan. The high demands from the settlement area occurs because there are attracting factors of the others land use like education, industrial, offices, commerce and services area. In other words, the city center facilities of Semarang becomes the attracting factors for the people. This condition cause to the high requests of order online transportation to the city center like education, working, or shopping areas. Online transportation from each sub-district is influenced by its land use. The wider land use of settlement area, indicate higher demands of online transportation to serve the customers' needs.

The driver services is strongly influence by the population and its land use. Land use gives more influenced to the drivers service than population. The services of each sub-district are supported by the short dwelling time of the passengers. The highest quality of the drivers service provides the maximum services to the users: comfortable, safe, easy and quick. Considering that Semarang city is a metropolitan city with high mobility of the people and the complexity of its mobility, the service area characteristics could be seen on the Figure 4.
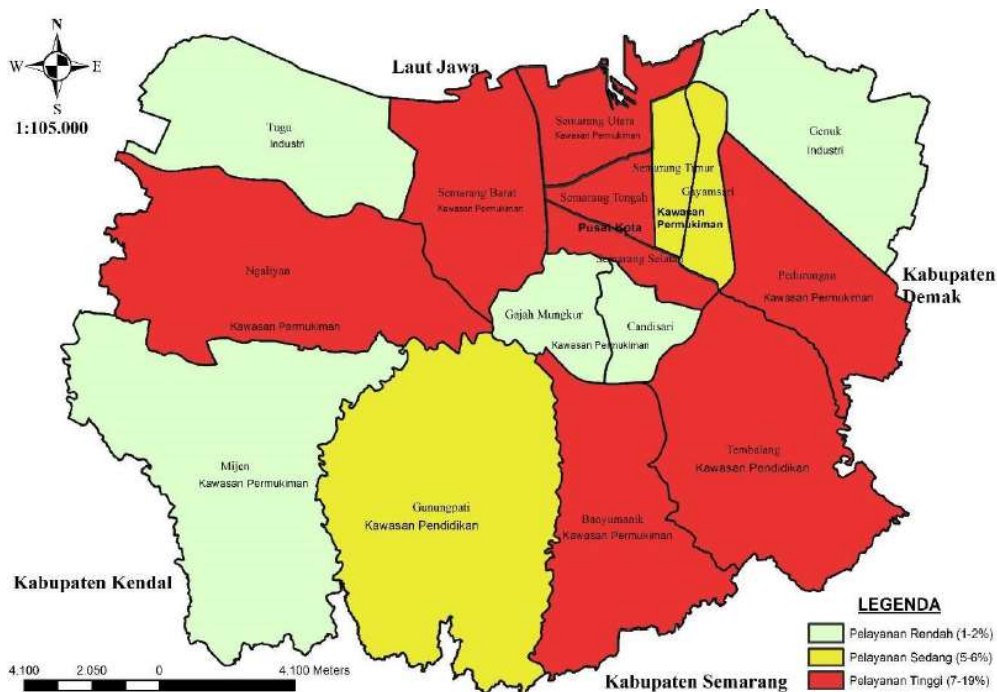

FIGURE 4. Online Transportation Services Area in Semarang City (low, moderate, high)

The existence of online transportation is considered capable of answering the failure of conventional transportation such as BRT (Bus Rapid Transit) in Semarang. The availability of conventional transportation is still not able to serve the entire movement of the Semarang community which is classified as high. Services provided by conventional transportation have not been maximized or to reach all areas in Semarang City. Limited routes and uncertain dwelling times are the main factors that make minimal conventional transportation services. On the other hand, people require other transportation mode that is flexible, fast, safe and comfortable. The emergence of online transportation in 2014 led to the shift of the Semarang City community from conventional transportation to online transportation. The following map illustrates that online transportation is able to complement conventional transportation services such as BRT (Figure 5.)
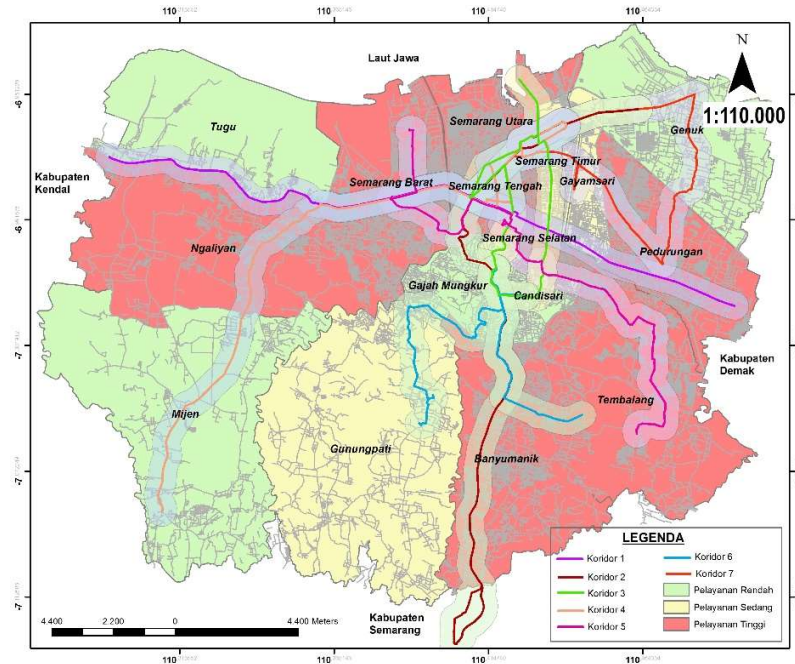
FIGURE 5. Overlay Online Transportation with BRT Route

Figure 5 showed that the coverage of online transportation services is wider than conventional transportation such as BRT. Where the maximum standard of people to walk is 500 m, and the BRT route has not been able to reach all areas in the city of Semarang. This condition requires people to look for alternative modes of transportation such as online transportation that can reach areas that are not served by the BRT route. With online transportation, it is expected to be able to complete public transport services so that the need for community movements can continue to be fulfilled. However, what happened was different, namely there was competition between online transportation and public transportation. Online transportation provides services with a more definite and concise door to door system and waiting time.

CONCLUSION

The characteristics of online transportation provision can be met by the operators for the users. Online transportation service is able to meet the needs of the people for various destinations: to schools, shopping malls, campuses and offices. Online transportation service has a similarity with the public transportation (Bus Rapid Transportation/BRT) of Semarang. Online transportation service rate in Sub – district of Semarang Tengah is 19%, which the highest rate compare to education and settlement areas. The majority of BRT services is in city center. Online transportation services have more benefit than BRT since they have door-to-door service. The users just order through application and do not need to walk towards the bus stop like BRT. The drivers arrive at the pick-up location and drop off them as their order. Besides door-to-door service, the exact dwelling time also gives another benefit to the online transportation. Online transportation is able to make a shorter time because it can get the closest driver to the pick-up location.

Characteristics of online transportation availability can be answered with services provided by online transportation to users. Online transportation services have been able to meet the needs of the population in traveling from the purpose of travel to schools, shopping centers, campuses, and offices. Online transportation helps residents to support their movements, especially local movements, namely the movement from the city center to the suburbs and vice versa from the suburbs of Semarang to the city center. The people of Semarang City use online transportation at the peak hour of the morning, which is 6:00 a.m. to 9:00 p.m. WIB by 65% then for the peak hour of the afternoon, which is 16.00-20.00 WIB by 35%. 100% of the movement was carried out by online transportation is a local movement, only to serve the City of Semarang with the intention of traveling among others with the intention of going to school by 31%, to campus by 27% and to the workplace by 42%. One of them was the movement carried out by

drivers to provide services to workers heading to South Semarang (office area (service)) and Gayamsari (industrial land use and trade and services).

Suggestions or recommendations for this study are public transportation management (frequency) should provide maximum services for the people in Semarang City, and it can meet the needs of mobility transportation mode. The improvement of pedestrian ways (suitable with services standard). The synergy between public transportation and online transportation. The improvement of BRT such as specific routes, integrated feeder transportation with the main transportation, and additional corridors of new routes.

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