The Smart Mobility Concept by Developing Online-Based Transportation Information and Communication Technology for Sustainable Transportation

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ABSTRACT

The advancement of communication technology is rather quick, resulting in societal changes. Many companies have begun to emerge as a result of communication technology advancements, one of which is the introduction of intelligent transportation in the form of online-based transportation services. People can better evaluate which mode of transportation is best for their mobility requirements by integrating transportation services with information and communication technologies. This study was carried out in order to identify smart transportation through the advancement of information technology and online-based transportation communication. This research employs a descriptive qualitative technique in which the author attempts to describe, analyze, and construct meaning regarding existent occurrences. The study's findings indicate that combining transportation services with the use of information and communication technology causes major changes in people's social lives, particularly in the usage of transportation for activities. Internet transportation combines the most recent transportation advancements with online communication technology to deliver community convenience. To order transportation online at any time and from any location. The Smart Mobility concept can be applied to online transportation, particularly online motorcycle taxis like Go-Jek and Grab a bike, by utilizing categories, indicators, and parameters tailored to the development of Online Ojeks, such as accessibility, sustainability, and information technology systems.

I. Introduction

Today's technology can be used in all aspects of life without limits. Humans never stop trying to make a new work that was previously done conventionally into an action that is collaborated by utilizing information technology (Damayanti, 2017). Now, public transportation, which was initially more conventional such as public transportation, motorcycle taxis, and taxis, after collaborating by utilizing electronic technology in Indonesia (Wahyuni & Rachmawati, 2019).

Because of technical advancements and the involvement of huge corporations in the transportation industry, several areas, including Indonesia, have started to implement the Smart Mobility concept (Battarra et al., 2018). Smart mobility is a technological system that merges the physical and digital worlds and is used to fulfill community requirements, greatly enhance the performance of a sustainable mobility system, and minimize energy consumption and carbon emissions (Lam & Head, 2012). Because of the emphasis on public transit, the Smart Mobility concept is more ecologically beneficial. The general development of online application-based transportation is one method of advancing the Smart Mobility idea (Ristantia & Hayah, 2018).

Furthermore, this internet transportation phenomena addresses people's worries regarding the security of public transit. This online transportation addresses people's worries by using the benefits

of data-driven apps, which allow consumers to determine the identity of the driver (Sugiyarto et al., 2020). With this benefit, the public may learn who will be the taxi driver they requested, along with the driver's information. This internet transportation application focuses the user's safety component. Typically, entire information about the rider is accessible in the application, such as the rider's name, contact information, and picture (Mulyani, 2018). The transportation service may then only be accessed by purchasing via the application, allowing clients to secure their safety and responsibility (Wahyuningtyas, 2016).

The multiple benefits provided by internet transportation have resulted in substantial changes in the social life of the community. Online transportation is expanding and very popular, particularly in the transportation service industry (Azizah & Adawia, 2018). This online transportation provides the most recent transportation technologies integrated with internet communication technology, allowing customers to book online transportation from anywhere and at any time (Prihatin, 2016).

Even with online transportation, it also changes habits and social systems in society (Rezky, 2020). Initially, people used conventional ways to use public transportation, and now people are starting to change their habits and turn to communication technology to order public transportation online (Sudirman et al., 2020). Furthermore, the emergence of online transportation such as Ojek Online, which is equipped with a guaranteed security system and consistency in attire and helmets, generates an image of ojek, which was originally a menial vocation but is now gaining status (Anwar, 2017). The emergence of online motorcycle taxis has the potential to influence people's perceptions of motorcycle taxi drivers, who are often seen as a menial career. The change in the mindset of motorcycle taxi drivers as a lowly job is proven by the increasing number of people who are interested in becoming motorcycle taxi drivers as a side job. Alternatively, even being the main job is one of the successes of Ojek Online (Rizal, 2019).

The intention of the transportation startup company owner to enable increased community mobility drove the creation of this online application-based transportation. In many circumstances, public transportation supplied by the government is unable to address popular concerns (Arfandi, 2019). A well-integrated transportation network system does not allow for high levels of community mobility, resulting in urban transportation issues (Kadarisman et al., 2016). People with a high degree of mobility demand longer journey times due to the absence of integration of public transportation networks, reducing the effectiveness of travel time (Made Suraharta, 2020). Furthermore, urban transportation issues like as congestion and air pollution are reasons why individuals are hesitant to leave their homes or businesses.

However, on the other hand, people are required to remain productive to meet their needs, for example, to eat, send or buy certain goods. Until then, online application-based transportation emerged as a solution that could serve the community directly (Safitry et al., 2020). Online transportation offers convenience, comfort, security, and much lower cost than public transportation that serves the high mobility of the community, such as taxis and conventional motorcycle taxis. Online transportation can minimize the risk of urban problems in terms of time, convenience, cost, and security because of the features of supporting digital technology such as GPS. In real terms, online transportation has become an alternative mode of transportation for people to meet their needs, so the preferences of people who use transportation services will undoubtedly prefer a transportation system that is easier and more practical (Delle Site et al., 2011).

The development of online application-based transportation services is a competitive requirement that necessitates the use of digital technology to facilitate people's mobility (Magfiroh, 2019). Online transportation is included in the Smart Mobility concept because to the importance of digital technology. Smart mobility is the best choice for developing a sustainable transportation network (Benevolo et al., 2016). Based on this, we will look at how the development of online application-based transportation helps the implementation of the Smart Mobility concept in Indonesia in this article.

II. Method

The phenomena of online-based transportation is researched and analyzed using a qualitative method in this study. According to Patton (2002), this qualitative technique allows for in-depth and detailed examination of topics. Approaching the field without preconceived categories can

contribute to an open, deep, and detailed study in qualitative research. As a result, to get a detailed descriptive study of the deployment of suitable information and communication technology in online-based transportation. The researcher will gather primary and secondary data to get complete and heuristic data. In-depth interviews and observations will be used to collect primary data. Simultaneously, secondary data on the implementation of online transportation communication technology will be acquired from books, journals, and photos/pictures (Grab Bike and Gojek).

III. Result And Discussion

The smart mobility dimension is a dimension of a smart city that emphasizes creating convenience for people to move around in their activities and move more intelligently. As for the components of intelligent mobility, these components are efficient transportation (Efficient Transport), multi-mode access (multi-mode access), and technology infrastructure (Wei et al., 2019)

The concept of smart mobility is related to the movement or mobility of people in smart cities, both inside and outside the city. The movement carried out is an effective and efficient movement. Movement is done by walking to reach places close and using public transportation to reach places further away. Making pedestrian paths that are safe, comfortable, and follow existing regulations is a priority. Pedestrian paths are used to reach places that are close to the city center and connect various places in the city center. Pedestrian paths also provide convenience for persons with disabilities. Bicycle lanes are made separate from pedestrian paths, and roads are equipped with instructions and signs (Pratiwi et al., 2015).

To reach faraway places, public transportation is used. Viewed from the environmental aspect, public transportation in smart cities is transportation that is environmentally friendly, efficient in fuel use, reduces dependence on fossil-based energy, and leads to the use of new and renewable energy. From an economic point of view, public transportation is a smart city that must be affordable by all people. They are mutually integrated and reach the whole city to support the community's economic activities. Viewed from the social aspect, public transportation must provide security and comfort for its users (Nuigraha et al., 2017).

Another thing planned as part of smart mobility is an effort to reduce the use of private cars on the streets. Reducing the number of private cars on the streets is expected to reduce traffic congestion. Then the principle of intelligent mobility in smart city theory is similar to e-transportation. Not only implementing smart mobility technology but also aspects that provide security, comfort, and sustainability. (Supangkat et al., 2018)

Through the smooth operation of intelligent traffic systems, the intelligent mobility society may finally come to fruition. To navigate efficiently through a city, it is necessary to have public transportation options that are effective and have a low impact on the environment (lower greenhouse gas emissions and lower energy consumption), to have safe networks and cycle paths that are environmentally friendly, and to trade parking spots with other drivers. However, mobility cannot be deemed intelligent if it does not contribute to sustainable development (Garau, Masala, & Pinna, 2016).

In recent years and particularly in the realm of transportation planning, the phrase "smart mobility" has developed into an idiom. After a successful first phase in which information technology and digital data were thought to be the answer to making mobility more efficient, more attractive, and improving the quality of travel, however, something was disappointing surrounding this concept: the gap between the academic potential provided by intelligence is far from the reality of mobility urban in the city.

When it comes to the search for a transportation system that is more environmentally friendly, intelligent mobility is often cited as one of the primary choices. It is also possible to see it as a coordinated collection of efforts aimed at boosting the efficacy of the city as a whole as well as the environmental sustainability of its operations. In other words, the term "Smart Mobility" may refer to an almost unlimited number of different efforts, the majority of which include the use of information and communication technology. ICT is the foundation on which smart mobility is built, serving as the connection between smart city infrastructure and the operational and planning activities of the city. This is accomplished via management, control, and optimization.

Beyond the numerous labels that are used to characterize "Smart Movement," the most promising uses of technology are those that may make urban mobility more environmentally friendly. Indeed, intelligent mobility is playing an increasingly important part, particularly in large cities, which have the highest concentrations of both population and activity, and as a result, have a greater demand for extensive and efficient transportation networks in order to guarantee a high level of accessibility. Every aspect of modern life, including new business ventures and the transportation industry, has been permeated by the rapidly advancing information and communication technology that is based on digital formats. The implementation of the Smart Mobility design via the use of technology in metropolitan areas has drawn the interest of significant organizations, which has led to the implementation of the design in many places. Because it focuses a greater emphasis on different forms of public transportation, the idea behind smart mobility is one that is more kind to the environment. One kind of innovation under consideration for the Smart Mobility design is the use of internet or online transportation.

Implementing the Smart Mobility concept will create a public transportation service system and a better mobility system to solve transportation problems. One is an online application; this research focuses on online motorcycle taxis. So that the categories, indicators, and parameters used are adjusted to the context of the development of online motorcycle taxis, which include accessibility, sustainability, and information and communication systems.

The accessibility category emphasizes providing safe and affordable transportation for all levels of society (Battarra et al., 2018). The development of transportation modes in the form of online motorcycle taxis from the conventional ones tends to be much more affordable than conventional motorcycle taxis. Pricing is regulated using an application system, so it is not biased in determining prices and is more transparent.

Ojek is also considered the most appropriate mode of transportation to serve the high mobility of the people. This is because the ojek shuttle system is adapted to user demand, meaning that they are picked up and delivered to their destination. This system provides added value for ojek transportation modes because users' travel time is more effective and efficient than public transportation modes such as buses or trains.

The strengthening mentioned above of the parking system aims to avoid prolonged conflicts between online and conventional motorcycle taxi drivers. Online motorcycle taxi drivers have a more comprehensive range of consumer services than conventional motorcycle taxis because they are regulated using an application system. Therefore, the majority of online motorcycle taxi bases are different from conventional motorcycle taxi bases; even in some areas, there are red zones intended for online motorcycle taxi drivers. The online motorcycle taxi red zone is a zone that is free from online motorcycle taxi drivers, for example, because the zone is controlled by conventional motorcycle taxis and so on.

Table 1. Existing Condition of Accessibility Category

Category	Indicators	Existing condition
Accessibility	Development of a New Type of Public Transport	Online Ojek, which was initially still conventional
	User Mobility Level	High mobility, depending on consumer demand (delivered to destination)
	Parking system strengthening	The online motorcycle taxi base is different from conventional motorcycle taxis.

The Sustainable category guarantees that the transportation provided is environmentally friendly and uses renewable energy. Online and conventional motorcycle taxis are included in public transportation that can be used, one of which is to reduce motor vehicle exhaust emissions. Although online motorcycle taxis in Indonesia do not use renewable energy, the establishment of online motorcycle taxis can at least reduce motor vehicle exhaust emissions.

This category also analyzes the indicators needed so that online application-based transportation can run sustainably. This means there is a need for new innovations to maintain application users to continue using the online application. One of them that is applied to the Go-Jek application is the track driver feature, trip sharing, and emergency calls. These features are used to enhance user

security. With the track driver feature, users can track the location of online motorcycle taxi drivers, likewise with the trip sharing feature, which can be shared with close relatives so that close relatives can find out the user's position and condition when traveling using the online motorcycle taxi mode of transportation. The trip sharing feature can also share information with close relatives in the form of pick-up locations and destinations, information about the driver and the type of vehicle, trip status, estimated travel time, to the route chosen by online motorcycle taxi drivers. Meanwhile, the emergency calls feature is intended so that users can report to the system regarding emergency conditions that occur while traveling.

Another innovation the Go-Jek transportation company provides is developing services in various aspects of life, not only in transportation. For example, Go-clean is a service system that is focused on providing services to consumers in the form of cleaning services, be it apartments, houses, or boarding houses; or Go-bills that provide services in the form of payment services for electricity, water, BPJS, and other bills without the need to queue; as well as Go-food which offers services in the form of food purchase services that are delivered directly to the destination.

Table 2. Existing Conditions for Sustainable Category

Category	Indicators	Existing condition
Sustainable	Advanced feature innovation	Track driver feature for user safety
	Service innovation in various aspects of life	Go-massage, Go-life, Go clean, Go-auto, Go-med, Go-bills, Go-food.

The Technology Information System category places more emphasis on the use of technology that can increase efficiency and have an impact on user behavior. The existence of software products using social media platforms through smartphone applications that offer modes of transportation can slowly change the behavior of application users. Online transportation is much more affordable than other public transportation and the various conveniences offered, with no payment, can already access the online transportation application. So that users tend to feel that what they have to spend is worth what they get, which can then change people's thinking patterns to use online motorcycle taxis as the primary mode of transportation compared to using private vehicles

Table 3. Existing Condition of Information Technology System Category

Category	Indicators	Existing condition
Information Technology System	Smart Mobility Platform	Social media via the smartphone application
	Application Products	Gojek, Grab, Uber

The existence of transportation problems and congestion that many parties still complain about has become homework for many parties, not only the government. Big cities like Jakarta and Surabaya are famous for congestion in the city center compared to their regions. This problem was finally answered by the presence of the Gojek and Grab Bike businesses by utilizing smartphone technology access with public transportation services that can provide convenience for users and consumers in ordering and using these transportation services. The existence of Gojek Online is finally able to change people's habits. At first, people used conventional ways to use public transportation, and now people are starting to change their habits and turn to communication technology to order public transportation online.

In addition, the availability of online motorcycle taxis that are outfitted with a guaranteed security system as well as uniforms in clothing and helmets has elevated the status of a profession that was formerly considered to be a poor one. The availability of online motorcycle taxis has the potential to alter people's perceptions of motorcycle taxi drivers, who are often looked down upon as working in a menial occupation. The perception that being a motorcycle taxi driver is a lowly career has begun to shift, as seen by the growing number of individuals who are interested in becoming motorcycle taxi drivers as a side job. [Citation needed] Alternately, even having the primary employment be one of Ojek Online's accomplishments is a success in and of itself.

The community's perspective on the safety of public transit was subsequently shifted as a result of the existence of Gojek and Grab Bike. Gojek and Grab Bike both have benefits in that they are equipped with apps that are linked to database storage and GPS, and these programs have the ability

to offer information about the identity of the driver. Because of these benefits, the general public will be able to immediately determine who the driver of the Ojek transportation they requested will be, along with the driver's information. The fact that Ojek Online discloses the full data and identities of its drivers in the Grab Bike and Gojek apps demonstrates that the company prioritizes its customers' safety above all else. The application provides access to comprehensive information on the rider, including the rider's name, contact information, and a picture of themselves. For the sake of the clients' safety and responsibility, this Online Ojek service may only be received by placing an order via the GoJek application

IV. Conclusion

Online Ojek transportation services, particularly for ordering, substantially facilitate today's society. People may simply move anywhere by having an application that is linked to this internet technology, anywhere and whenever, rapidly and in real-time. This efficient communication technology addresses social issues and public concerns regarding public transit, particularly in large cities like Jakarta. Online transportation service providers turn out to be a solution to traffic congestion in the Jabodetabek region, as well as a source of ease and comfort for customers. Online transportation, particularly motorcycle taxis, is included in the Smart Mobility concept because it falls into one of the three (three) categories provided by (Battarra et al., 2018), namely accessibility, sustainability, and information technology systems. With the widespread development of online application-based transportation modes, the government is expected to issue policies that support the development of online transportation in Indonesia, particularly for those experiencing the impact of online transportation, so that the development of online transportation in Indonesia benefits all parties rather than just a few, because planning should benefit all parties involved.

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