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# Ride-sharing business model for sustainability in developing country: Case Study *Nebengers*, Indonesia

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**Abstract.** The growth of population and urban economy increased the need for humans' mobility to support their activities. On the other hand, online Information and Communication Technology (ICT) is growing rapidly and more affordable. Within few years, there is some sharing economy business formed by using online platform. This condition brings through the emergence of ride-sharing business model using an online platform which can be beneficial to sustainability. This research aims to explore one of ridesharing business models which use the online platform and its impact on sustainability. This research used the procedure of case study method with a single case study of *Nebengers*. This research explores the case study with the scope of this research is limited by using several conceptual frameworks, they are sharing economy business model, four elements of a business model for sustainability (BMfS), Social Construction of Technology (SCoT), sustainable mobility and agency theory. *Nebengers* is a sharing economy business using online platform that historically can be explained using Social Construction of Technology (SCoT) Theory. There are conflicts between *nebengers* entrepreneur and the city government. *Nebengers* disrupts traditional and formal public transportation services which are managed by the government. However, *nebengers* also contributes to achieve the city government goal in developing sustainable mobility. The future challenge is how to arrange ride-sharing collaborative governance business model for sustainability in the cities in Indonesia.

## 1. Introduction

The growth of population and urban economy increased the need for humans' mobility to support their activities. On the other hand, online Information and Communication Technology (ICT) is growing rapidly and more affordable. Within few years, there is some sharing economy business formed by using online platform. This condition brings through the emergence of ride-sharing business model using an online platform which can be beneficial to sustainability. This research aims to explore one of ridesharing business models which use the online platform and its impact on sustainability. This research used the procedure of case study method with a single case study of *Nebengers*. This research explores the case study the scope of this research is limited by using several conceptual frameworks, they are sharing economy business model, four elements of business model for sustainability (BMfS) [1], Social Construction of Technology (SCoT) [2] [3], sharing mobility for sustainable mobility [4] and agency theory [5]. *Nebengers* is a sharing economy business using online platform that historically can be explained using Social Construction of Technology (SCoT) Theory.

**Table 1. The elements of sharing economy business model [6] [7]**

Aspect	Description
Sharing economy business: platform for collaboration	<ul style="list-style-type: none"> <li>• Types of platforms used in delivering services</li> <li>• Role and functionality of the platform</li> <li>• Specific use of the platform by the users, customers and company</li> <li>• Types of activities performed by the company and users while interacting</li> <li>• Degree of platform centrality to the company's core</li> </ul>



Aspect	Description
	business
Under-utilized resources	<ul style="list-style-type: none"> <li>• Kind of users' resources which the peers share to enable sharing</li> <li>• Reliance on the excess capacity of users</li> </ul>
Peer-to-peer interaction	<ul style="list-style-type: none"> <li>• Types of peer-to-peer interactions</li> <li>• Types of peer-to-peer transactions</li> <li>• Relevance of interaction and transaction to business model and performance</li> </ul>
Collaborative Governance	<ul style="list-style-type: none"> <li>• Legal structure, equity model, governance structure and mechanism, decision-making processes, consultation, and CSR and engagement strategies</li> </ul>
Mission-driven	<ul style="list-style-type: none"> <li>• Formal mission statement</li> <li>• Relevance of social and environmental value and impacts in relation to economic value and to the business as a whole</li> <li>• Evidence on how the mission is implemented: strategies, practices</li> </ul>
Alternative funding	<ul style="list-style-type: none"> <li>• Type of funding and stage in which the funding is requested/used.</li> <li>• Extent to which the business utilizes or prioritizes alternative funding such as crowdfunding, equity-based crowdfunding or similar</li> </ul>
Leverage on technology	<ul style="list-style-type: none"> <li>• Type of technology used by the business</li> <li>• Relationship between the technology in use and the core business</li> <li>• How the business uses technology to operate</li> </ul>

**Table 2. Elements of a Business Model for Sustainability (BMfS) [1]**

Element	Definition
Value proposition	Provide measurable ecological and/or social value in concert with economic value
Supply chain	Involve suppliers who take responsibility for their own as well as for the focal company's stakeholders
Customer interface:	Motivate customers to take responsibility for their consumption as well as for the focal company's stakeholders
Financial model	Reflect an appropriate distribution of economic costs and benefits among actors involved in the business model and accounts for the company's ecological and social impacts

## 2. Result and discussion

### 2.1. Nebengers profile and social construction of technology of Nebengers application

This sub-section describes *Nebengers* profile based on information source from *Nebengers* Company. *Nebengers* is a social movement to give each other a ridesharing which exists nowadays with a lot of popular online transportation. There are about 80,000 members of the community and 150 private vehicles active in *Nebengers* application. There are some conditions when *Nebengers* can be relied on, such as a daily going home trip, homecoming trip, and weekend activity to commute out of town. Nowadays, *Nebengers* is managed by five young people, including Andreas Aditya Swasti, an IT department employee at a private company. This community was started in 2011 when Andreas was aware that the cause of traffic jam in Jakarta is the higher increase in the number of vehicles than the growth of existing road length. Then, Andreas Aditya Swasti thought how to get to a destination without riding either his private vehicle or public transportation which sometimes is uncomfortable.

The answer is carpooling or ride-sharing with someone's vehicle with the same destination or direction. The idea started with creating a Twitter Account named *Nebengers*. This account would help people to find their carpool partner with the same destination. The carpooling is also based on the agreement among each member of the *Nebengers* community. Then, *Nebengers* begins to demand, especially by citizens of Jakarta and Bandung. This concept is considered suitable for those who need to commute between the two cities. Currently, *Nebengers* also becomes an alternative transportation in *mudik* season at Ramadhan Idul Fitri. *Nebengers* evolves not only ride other people's vehicles, but also become a community where they can share with others who need it. This community also can make a new friendship because it is not just a ridesharing to the same destination, but also a new meeting which can continue to the next one.

The *Nebengers* app is an app that can help urban citizens in carpooling activity. This app has been designed to answer the needs of carpooling and the performance assessment of *Nebengers* for almost 3 years. In the previous platform, which is Twitter, there are some difficulties in quantifying some activities, such as how many trips occur each day and the most crowded route per days. This new platform is expected to assess its performance, and estimate solutions to develop *Nebengers* as one of the Smart City transportation solutions in several cities. In addition, the previous platform, Twitter is limited for those who have a Twitter account. Therefore, with this new platform, *Nebengers* gives access to everyone who will be able to do carpooling activities.

This platform features "Create *Tebengan*" for those who have an empty seat in their vehicle, and want to share it. They can choose routes, departure schedules and sharing either the cost of gasoline or toll fee per person. Beside, people who want to do ridesharing can use 'Search *Tebengan*' feature, then they will be able to book a seat and negotiate for the payment with 'Chat' feature. Afterwards, the rider who shares the empty seat can either "Approved" or "Reject".

With the Notifications and Chat feature, the communication of rider and the passenger can be simplified. When meeting at the meeting point, the rider is required to press the "Getting Started" feature to indicate that the trip begins. If the trip is over, the rider will press "End the Trip" feature. After the trip, the passenger can review the trip with the rider.

*Nebengers* is a ride-sharing marketplace which helps to connect between the owners of the empty seat in their vehicle named as "Captain", with "Passengers" or the one who wants to do ridesharing. *Nebengers* makes a community, so users can do a ride-sharing with another users who are registered at *nebengers.com* to save their travel cost, make new friends, share experiences and support the green environment. To make sure everything works well, fun and rewarding for both *Nebengers* users and managers, *Nebengers* sets terms and conditions agreement. *Nebengers* does the following things:

- a. Provide applications in the form of websites, Android and iOS so users can provide a ride and look for a ride
- b. Do accuracy calculation on the trip route submitted. Submitted data does not violate ethics such as SARA, pornography and other matters that interfere the user's security and convenience
- c. *Nebengers* may provide user-related data, travel transactions that occur in cases of criminal offences and crimes.
- d. *Nebengers* invites its users to post the route on the application website, android or iPhone
- e. Provide social media information to the users about both rider and passenger in consideration for those who want to go together
- f. Provide a verification system for rider/ captain and passenger.

*Nebengers* does not do the following things:

- a. Provide user A's recommendations to come with Captain B.
- b. Misusing personal data and harming its users
- c. Provide a personal mobile number to other users.

*Nebengers* users need to do the following things:

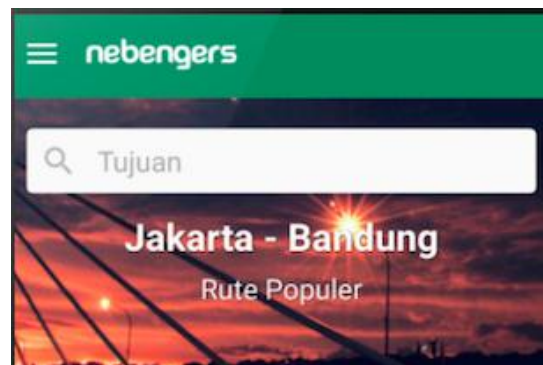
- a. Obey the ethics and laws under the Indonesian Constitution of 1945

- b. Post on the Nebengers app to give a ride or look for a ride
- c. Maintain the security and comfort of other users.
- d. Make timely appointments.

If people are looking for a ride in *Nebengers* using Twitter, people can use this hashtag *#CariTebengan* and make a new tweet using this format, for example "*#CariTebengan* Jakarta-Bandung | 1 seat | 21 Maret 2016 09:00 | share gasoline and toll". People also can use *Nebengers* Application with the following steps:

1. Search Destination

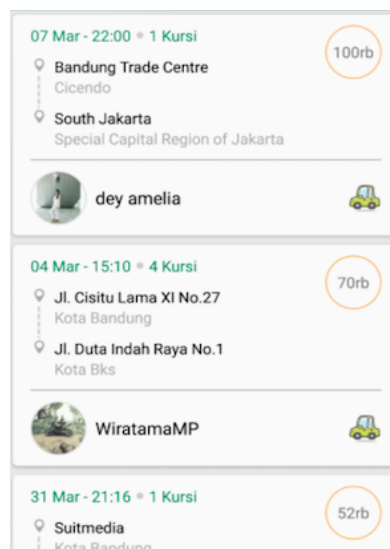
Enter your destination in "Tujuan" box.



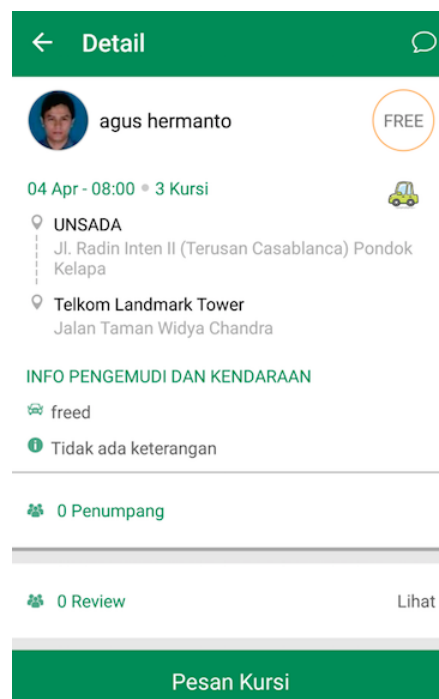
**Figure 1.** *Nebengers* Application Menu Options: Search Destination

2. Booking a seat

If there are some provided routes, you can choose a route that you want. Then, you will get the carpooling detail. You can either contact the rider by pressing Chat icon in the top right corner or book a seat by pressing 'booked a seat' button.



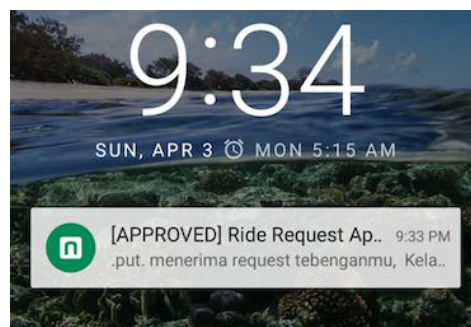
**Figure 2.** *Nebengers* Application Menu Options: Available Routes



**Figure 3.** *Nebengers* Application Menu Options: Booked a Seat

### 3. Meeting and Starting the trip

Soon after the customers press the button "Pesan Kursi", their request has already been logged in to the Rider. If it is approved, then they will get a notification.



**Figure 4.** *Nebengers* Application: Approved Ride Request

*Nebengers* is a community that consists of people who are willing to do ride-sharing. In the first phase, *Nebengers*'s members communicate via social media twitter. The next phase, *Nebengers* develops a mobile app namely *Nebengers*. In the Social Construction of Technology (SCoT) perspective, the online platform *Nebengers* is developed to facilitate ride-sharing behavior.

### 2.2. The characteristics of the ridesharing business model for sustainability

This section discusses the details description of characteristics of the ride-sharing business model for sustainability.

**2.2.1. Platform and technology.** Type of platforms used in delivering services is an online platform. The technology used initially is social media and then *Nebengers* application is developed as the online platform. The role and function of online platform are to facilitate the person who wants to

involve in ride-sharing activity. The online platform is used for transactional media of ride-sharing information. The platform is used by *Nebengers* company to determine the performance of *Nebengers* application and the activities of *Nebengers* community. Online platform plays an important and decisive role in the successful *Nebengers* activities. The online platform facilitates *Nebengers* community interaction quickly and widely. If there is no *Nebengers* application platform, it can still be run by utilizing Twitter.

*2.2.2. Mission-driven and value proposition.* The *Nebengers* company claims that *Nebengers* application can be a smart city transport solution in several cities in Indonesia. Formally *nebengers* states that the objective values to be achieved are:

- a. 3 Cars Being 1. Private vehicles leave many empty seats; therefore, let us get together to overcome the traffic jam.
- b. More efficient. By sharing, the transportation is more cost-effective and makes the trip more efficient.
- c. More fun. The beauty of sharing empty seats, reducing city congestion and expanding friendship for business as well as spouse.

*Nebengers* also claims that ridesharing has benefits among others:

- a. Transportation cost savings (gasoline and toll fee)
- b. Travel expenses (gasoline and toll fee) can be split together so that the trip becomes more efficient and economical.
- c. Add companions.
- d. Environmentally friendly.
- e. Expand business relationships.
- f. Minimize stress during traffic jam because there is a friend on the road

In other words, the value of the *Nebengers* can reduce emissions and congestion, and subsidize driver costs.

*2.2.3. Underutilized resources and supply chain.* The vehicles used are private vehicles owned by people who want to share their vehicle. The offered vehicle has an unused empty chair (*underutilized*).

*2.2.4. Peer to peer interaction and customer interface.* The transacting party in the ridesharing was originally a colleague of close friends, neighbors, and peer to peer. Then, the party participating in ridesharing could be anyone who can come. Related to this, there is a security issue, but to minimize it, *Nebengers* makes a mechanism that ride-sharing community must register first with their identity. Then, there is a review and rating mechanism to validate the truth or make sure that the parties are safe. Ride-sharing community may mutually reject if it does not match, and it is okay to accept if it fits. In other words, those who can join are close friends, neighbors, and even new people who then become friends. If they are appropriate, they will be involved in continuous ride-sharing when the seat is available. There are also thirteen users out of twenty users who are satisfied by *Nebengers* services. It indicates that *nebengers* does a nice job at interacting with the one who has an empty seat and the passengers.

*“Warid, a Student who used Nebengers said that the services of Nebengers is as good as an online taxi in a good way, and it was a great experience. Because the members of Nebengers are nice and friendly. According to him, Nebengers is non-money oriented service like any other online taxi services, that is why the members of Nebengers are nice and friendly.”*

*2.2.5. Type of governance.* The governance model is private corporate. There is a partnership with sponsors.



*2.2.6. Financial model/alternative funding.* At first, the founders of *Nebengers* practised their own ride-sharing culture with their close friends. Then, the founders of *Nebengers* propagated the idea and used Twitter platform. At that time, the founders of *Nebengers* only facilitated it without getting any profit from the transaction. Transaction payments are made by the ride-sharing community self. Then, the *Nebengers* company has created the *Nebengers* application which facilitates the transaction of ride-sharing community. The *Nebengers* company gets the profit from downloading apps activities by ridesharing community on Android and iOS. *Nebengers* company gets revenue from sponsorship from various parties such as Top 1, Nu Green Tea, SmartFren, Indosat Ooredoo, XL, Telkomsel, Ice Cool, Datsun, Garda Oto, and Hard Rock FM Jakarta. In other words, the ride-sharing community payment is based on the agreement. Meanwhile, there is no payment from ride-sharing community to *Nebengers* application company for each ridesharing transaction.

### *2.3. Nebengers contribution to sustainable mobility*

*Nebengers* community mobility activities is a form of sustainable mobility because it reduces local transportation's environmental footprint through reducing the utilization of car and fossil fuel consumption. The evidence that *Nebengers* contributes to creating sustainable mobility is based on information from one of the *Nebengers* community members that changes his mobility mode from private car utilization to ride-sharing. Based on our survey of twenty users of *Nebengers*, there are four out of twenty users chose this reason about why they do carpooling activity, because they want to reduce air pollution in Indonesia.

*Mr. Yudhi is a 36-year-old male entrepreneur who regularly uses the Nebengers application from Bandung (Gasibu) to Jakarta (Cibubur). He uses Nebengers application once or twice a day. His level of education is Bachelor. At first, he used Twitter and then used the Nebengers app. Before he joined Nebengers, he used a private vehicle from Bandung to Jakarta. He spent Rp 75,000 per trip. The motivation of his involvement in Nebengers ride-sharing community is to reduce transportation costs and meet new friends.*

In our survey, there are fifteen out of twenty users do carpooling activity. They used to drive their private car. They have changed their mobility mode from private car utilization to ride-sharing. At this point, *Nebengers* community mobility activities is a form of sustainable mobility because it reduces local transportation's environmental footprint through reducing utilization of car and fossil fuel consumption.

### *2.4. Principal-agent relationship of Nebengers entrepreneur and city government*

Online transportation in Indonesia is regulated by Transportation Ministry Regulation Number 108 Year 2017 about organizing non-route public vehicles/transportation. Based on the review of the regulations, it is identified that *Nebengers* is a legal subject that is regulated as a land transportation application company. Meanwhile, the members of *Nebengers* ride-sharing community are not public transport companies. They are not subjected to the law in the regulation. However, based on agency theory, there is a principal-agent relationship between city government in Indonesia and *Nebengers* entrepreneur. The city government is a principal, on the other side, *Nebengers* entrepreneur is an agent. There are conflicts between *nebengers* entrepreneur and city government. *Nebengers* disrupts traditional and formal public transportation services managed by the government. Nevertheless, *Nebengers* also contributes to achieve city government goal in developing sustainable mobility.

## **3. Conclusion**

*Nebengers* is a community that consists of people who are willing to do ride-sharing. In the first phase, *Nebengers*'s members communicate via social media Twitter. The next phase, *Nebengers* has developed an mobile app namely *Nebengers*. In this case, the online platform *nebengers* was developed to facilitate ridesharing behavior. The characteristics of *nebengers* are using peer to peer (P2P) platform type and underutilized shared resources. According to four elements of a Business Model for Sustainability (BMfS), *nebengers*'s values are to reduce emissions and congestion, and



subsidize driver costs; *nebengers*'s supply chain is personal vehicle; *nebengers*'s customer interface is colleagues or neighborhood; *nebengers*'s financial model is small fees charged for users. *Nebengers* community mobility activities is a form of sustainable mobility because it reduces utilization of car and fossil fuel consumption. Based on agency theory, there is a principal-agent relationship between city government in Indonesia and *nebengers* entrepreneur. The city government is a principal, on the other side, *Nebengers* entrepreneur is an agent. There are conflicts between *Nebengers* entrepreneur and city government. *Nebengers* disrupts traditional and formal public transportation services managed by the government. However, *nebengers* also contributes to achieve city government goal in developing sustainable mobility. The future challenge is how to arrange a ride-sharing collaborative governance business model for sustainability in the cities in Indonesia.

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