

## A Ride Sharing Service Design in the Shared Economy Era -Focus on Asia -

Yoo Chaemoon (\*)

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**Abstract:** The consumption trend of modern society is changing from ownership to sharing, and from excessive consumption to cooperative consumption. Based on this, sharing economy services are applied in various fields such as Space (e.g., Airbnb, We work), transportation (e.g., Uber, Didi Chuxing, Grab, Lyft etc.) and Learning (e.g., Coursera). With the increase of information accessibility due to the popularization of smart devices, the sharing economy is rapidly spreading. Especially, in the case of the automobile sharing market, it is expected to become a mega trend in the future as the gap in the existing market is supplemented. This study aims to examine the direction of future development model as sustainable design.

**Keywords:** Mobility – Sharing Economy – Ride-sharing – Service Design – Asia.

[Resúmenes en español y portugués en la página 267]

### Introduction

Since the industrialization era, 'ownership' that satisfies one's desire by mass production of goods has been recognized as a way to reveal one's identity and as a basis of economic activities for differentiation from others, beyond the meaning of simply having a goods. In his book, *The End of Work*, future scholar Jeremy Rifkin predicted that 'ownership' would be replaced by 'connect' and market would be replaced by network, and that the time when suppliers and users would emerge as the main players of the market, not the structure of sellers and suppliers. The sharing economy, which started in 2008 due to the global financial crisis, has achieved rapid growth by providing services at the desired time of active consumer class and owner of goods based on the popularization of smart devices through the spread of ICT technology.

According to PwC, the sharing economy market has been growing rapidly since 2010. And the potential value of sharing economy is expected to increase by about 20 times from \$ 15 billion in 2010 to \$ 335 billion in 2025. Jeremy Oyang's Honeycomb model shows that the sharing economy will increase by about 20 times in 2014 from finance, products, food, services, transportation, and space. The sharing service, which was a total of six areas, was in 2016 in 'Collaborative Economy Honeycomb 3.0', which included finance, products, food, service, learning, government and urban administration, health, and logistics. There are 16 areas of economics, including workers support, wellness and beauty, mobility services, vehicle sharing, corporation and organization, analysis and reputation. It can be seen that it is gradually expanded to various industries ranging from lodging, household appliances, clothing, and transportation. (Jeremiah Owyang, honeycomb 3.0) This sharing economy will have a great social impact with the emergence of a new economy, and it is related to practitioners and policy makers. (EU

Environment, 2013, Hamari et al., 2016) However, there is little research on the relationship between new economy and regulation.

In this era, when the design of all things is difficult to differentiate products, the focus of corporate innovation is gradually shifting to service (Trend Korea, 2019), which is a phenomenon that can be easily seen in the automobile industry. The change of the automobile industry, which was mainly focused on production, can be represented by the keyword C.A.S.E. This means a connectivity, autonomous driving, shared and service, Electrification. (Ko, 2019) When we look at these keywords, we can see that automobiles are changing from transportation to platforms that pursue the value of movement and provide various services.

In addition, the transportation environment has been continuously changing around the world, and the social phenomenon such as population concentration phenomenon, population aging, economic depression, and the development of technology in the mobility industry have played a major role in growing the shared economy in the transportation sector. (Weekly KDB Report, 2017) The car sharing market, which is a representative service of the mobility industry, is divided into car sharing service and ride sharing service. While the carsharing service is rapidly growing with the addition of platform companies and manufacturing companies, the ride sharing service is experiencing difficulties in implementing the service according to legal regulations and opposition from stakeholders in the existing automobile industry.

In this paper, in order to understand the research topic, firstly, the literature review about sharing economy and Sustainability and case study of ride sharing in Asia, Korea, China, Vietnam, Indonesia and Singapore, analyze the overall-situation of stakeholders surrounding the industry, and examine the direction of sustainable business models in the future.

## Understanding about sharing economy

### Definition of Sharing economy and Business model

The definition of sharing economy first appeared in Martin Witzman's paper "Sharing Economy: Conquering the Depression" in 1984 (Yoo, 2018) and Lawrence Lessig embodied the concept of sharing economy in 2008. The sharing economy is defined as 'economic activity in which non-price social relations play a major role' as a contrasting concept of commercial economy, and it operates as a contribution to the contents itself, not as a purpose of monetary compensation. (Lawrence, 2008) Schor defined companies like Airbnb and Uber as the new market models of the earliest stages of attention since the explosive growth. (Schor, 2014; Aleksandra, K 2016) The sharing economy is basically made up of Owner, the provider, and the user who wants to use the resources, that is, the user, and as mentioned above, the shared service activated by the popularization of smart devices includes platforms because the provider and the user trade on the platform. (Nam, 2017) Providers and users request sharing and sharing of resources owned by themselves based on platforms and use of shared resources, and obtain accessibility to the shared market. The user uses the resource through the platform, pays the platform for the cost of the resource and service platform, and evaluates the use. The platform has a business structure that pays the provider for resource sharing.

### Characteristics about sharing economy

The most prominent aspect of the development of the economy from the existing traditional economy to the shared economy is the paradigm shift from the pattern of excessive consumption based on competition to the cooperative consumption based on trust. (Kim and Oh 2013) Trust is the core of social capital, largely divided into 'trust in people' and 'trust in institutions' (Giddens, 1990). This is intangible infrastructure (Zak and Knack 2001) that reduces transaction costs and economic uncertainty. Increasing trust reduces transaction costs and uncertainty. In addition, it increases investment and grows the economy. (Aghion et al., 2009). This concept applies equally in the shared economy. According to Botsman, a sharing economy is a transaction through trust with someone who has no relationship, and if trust is accumulated, the user's intention to use sharing services increases. (Park, 2015) Because of this, the sharing service is evaluated both by users, providers and users after using the service, and the reliability of the service is maintained through this evaluation.

## Sustainability Design

After the global financial crisis, many companies went bankrupt and mass unemployment occurred. In order to escape the global economic downturn crisis, there is a lot of discussion about the role of companies for sustainable balanced growth of society. The concept of sustainable design is becoming an issue in the design world. (Yoon et al., 2013)

Sustainable design is generally used in combination with Eco Design, 3R Design (Reduce, and Green Design (Yang, 2012), and it is defined as suggesting a problem solving method by designing sociocultural, economic and environmental problem solving more universally. (Yoon et al., 2013)

### Components of sustainable design and Sustainability 2.0

The elements for sustainable social implementation are 3C, 3P, 3R. Sustainable social implementation requires efforts to understand society basically. (Kim, K.H, 2011) 3C is defined as a community, community, and country to know the public value of the community. 3P is composed of performance, human, and products, and it is a way to strengthen the image of the company and increase the reliability by considering the user. In the case of 3R, the user reduces, recycles, and rewrites the use of goods, because the value increases when the user participates, not just receives it in one direction.

The components of sustainable design can be divided into companies, institutions (states), and users. The users are the main agents of sustainable design and their use of sustainable design can affect the service planning, technology development and the regulation law of the country. (Yang, 2012) These three elements are mutually secure, and new countermeasures may emerge.

When the existing company provided information to consumers in one way, it was difficult to cope quickly when the corporate environment changed. Sustainability 2.0 is a system that is made with consumers. Through social media, companies provide the manufacturing process and information of products, thereby enabling users to promote the consumption of brands and deliver the value of the company by themselves, and to achieve brand development in social relations. (Yang, 2012)

### Service analysis method

As we have seen, the shared economy is a new economy, so it is necessary to analyze not only the service but also the stakeholders surrounding the service, so we tried to look into the ride sharing services in depth through the analysis of stakeholders. The stakeholders of the service are divided into the stakeholders outside the service and the stakeholders inside the service. Outside, the regulations of the government and the taxi industry, and the internal stakeholders can be defined as users, suppliers, and platforms. (Lee et al., 2016) This is organized into companies, institutions (states), and users, which are components of sustainable design.

### Type of Shared Car

The United States Department of Transportation defines shared mobility as a shared use of cars, bicycles or other means of transportation in the short term. There are various business models within a shared mobility bound in comprehensive terms. (Shaheen, S. et al, 2017) Shared-Use Mobility Center is divided into service elements

surrounding Bike Sharing, Car Sharing, Ridesourcing, Ridesharing, Public Transit, Personal Mobility and other shared mobility. 2015) Shaheen divided the shared mobility into five areas: Car Sharing, Personal Vehicle Sharing, Bike Sharing, Ride Sharing, and OnDemand Ride Service. (Shaheen, S. et.al, 2017) This is largely divided into Car-Sharing and Ride-Sharing. Also, it can be classified into four categories based on the subject of the transaction (corporate, individual /personal and individual), and the subject of the transaction (car, driving).

## A Case Study of Ride Sharing

### User Process

GHG emissions in the transport sector have more than doubled since 1970, accounting for about 23% of Co2 emissions (Edenhofer et al. 2014, Douglas Oet al. 2015) Rift co-founder John Zimmer emphasized the need for ride sharing, saying that ride sharing is a huge opportunity to save a lot of money and reduce the traces of humanity that pollute the environment. These ride sharing services are on-demand services that are performed by users of On-demand Service services in the same four-step process: destination setting, vehicle call, movement, payment and evaluation. Applications receive information continuously on the location of taxi drivers registered as providers of services, which are used for the purpose of quickly connecting users who request services. When the user sets the current location and the destination of movement, the application proposes the charge for the distance. After checking the proposed fare in the service, when the user sends a request for use (a call request), the service connects with the article to deliver information to the user who requested the current service and the destination of movement, and at this time, the user sends the location and vehicle information about the connected article to guide the time the article comes from the current user's location. After that, the article moves to the user's location, moves to the user's destination, and then proceeds with the payment. The automatic payment is usually made with the card registered by the user with in the application, and the evaluation of the service is completed.

### B2C model

The B2C model is a form of ride sharing platform company that owns a vehicle, and users and service providers are connected based on the platform. In this model, the service owns the vehicle, and the service provider provides the service by utilizing it. Because the vehicle is owned by the company, the brand logo is applied to each vehicle, and the brand awareness system is also considered. As stated above, the shared economy must be fully trust worthy by users and providers to establish a true sharing. In case of the vehicles in which the brand logo has in the front of car, the reliability can be improved to user than the vehicles of individual. The model includes China's Didi Chuxing and Korea's 11-seater car ride sharing service Tada. The services belonging to this model aim to continuously provide

improved services to users than existing taxi services. In the case of Korea 'Tada' service, which meets the needs for the improvement of Pain point of existing taxi service, the price is higher than the existing taxi fare, but in six months after the market launch, the number of members grew to 500,000 and 4300 drivers, and the rate of re-boarding is very high at 89%. Tada, which has succeeded in improving the service of taxis, is preparing to launch Tada Premium luxury taxi service. In the case of the B2C model, the service is managed by the company, so it is better than the service provided by individuals to individuals. Because it provides services, users are satisfied with the service.

### P2P model

The P2P model is a model of Uber, a leading company in ride sharing that connects users, individuals and individuals who want to use cars and services. This is the most common model of ridesharing, and many services such as Grab, GojekIndia's Ola, and Korea's Fullers, which are called Uber in Southeast Asia, belong to this model. This model connects individuals to individuals based on the platform, so it provides services to individual vehicles, which differs greatly depending on the vehicle's satisfaction with the user's service experience. The Grab Service in Vietnam provides a helmet and a jacket with the Grab brand logo to the provider when it is a motorcycle sharing service, making it easy to find the motorcycle that the user calls. However, in the case of a car, there is no logo of the service outside the vehicle, so it is difficult to find the vehicle called.

As Uber has expanded into various industries such as Uber Eats and Uber Rides, Grab and Gojek are expanding into other service industries other than transportation. With the introduction of Grab Pay, Grab Express, a delivery service, and other businesses such as Grab Food are also growing. Based on this, it is serving \$ 4.5 billion from global investors earlier this year. Go jek, which started as a motorcycle ride sharing service in Indonesia, is growing as a living platform. With Indonesian medical start-up, Halodak, it is being prescribed and diagnosed remotely by a doctor at night, and it is invested in services that do not require motorcycle drivers such as Go-med service, which is a drug delivery service app that can be delivered home, Go-med service, It is making a difference by increasing the number of people.

## Ridesharing Markets and Regulations by Country

### Korea

The domestic car sharing market, which has grown rapidly due to the advantage of reducing the complexity and hassle of the acquisition of the existing car rental market and the ability to rent a short time of 10 minutes, is expected to expand from 100 billion won as of the end of 2016 to 1 trillion won within the next five years. (Korea Research Institute for Human Settlements, 2018) In particular, So-car, the number one domestic

car sharing company, has grown rapidly from 510,000 in 2014 to 5 million in 2019, while Ride Sharing has been regulated by the provisions of vehicle sharing laws and similar law sand regulations. The market is formed. The Ridesharing market in Korea began in 2013 when Uber entered the Korean market. The Korean taxi market under the government's strong regulations has been under oversupply when Uber enters the market, and the taxi union has exerted strong pressure on the government, starting with the union. (Oh, 2016) Uber eventually withdrew from Korea, and the pressure that led to refusal to ride various ride sharing services such as Kakao Taxi and Poolus allowed commute time for carpool, and the technology of the platform was combined with taxi instead of car to improve taxi service. However, the taxi industry is illegal in ride sharing services, and there is no change in the opposition position, which is a hindrance to the growth of services. Among these, VCNC, a subsidiary of So-car, a representative vehicle sharing service in Korea, launched Tada, a ride sharing service consisting of only 11-seater vans in 2018. The Tada service is a trend that the service is gradually expanded by providing high quality services to users, and there is no problem in legal constraints, which are the biggest obstacles, based on Article 34 of the Passenger Car Transport Business Act, which states that "it is possible to arrange articles only for those who borrow a passenger car from 11 to 15, those who are 65 years old, disabled, foreigners, and corporations that rent cars for more than 6 months.

### China

In 2017, the share economic market transaction in China was about 4920.5 billion yuan, with the population participating in the shared economic activities exceeding 700 million, and the number of service providers reached about 70 million. (Wu Xiaolong et al. 2019) This is the world's No. 1 market with Baidu estimated vehicle sharing market size of 27 trillion in 2018. In the vehicle sharing field, DidiDi Chuxing, a ridesharing service platform that has grown rapidly for a short period of time, subsidizing both passenger and drivers, merged with Uber China, making it the number one service in the unique vehicle sharing market, accounting for 90% of the Chinese market. The Ministry of Transportation and Transportation announced the plan to implement online vehicle reservation service management in 2016, and announced a new regulation plan to restrict the share of vehicles and driving sharing markets to local residents and registered vehicles in 2017, though the vehicle sharing is legalized and the market for driving sharing is actively fostered. (Seoul Digital Foundation, 2018), but the reliability of the driver management and information management system of DidiCusing has been lowered due to the murder of passengers using DidiCusing in 2018. From 2019, the driver identity and license regulations for car and carsharing companies were strengthened. (Samsung Global Research, 2019)

### Vietnam

Vietnam, which has not enough transportation facilities, has only 10% of public transportation utilization due to

the absence of public transportation in the city with a population of 8 million. (Lee, 2016) Also, according to the 2015 Global Living Costs Report (Economist Intelligence Unit, 2015), taxi fares in Vietnam were twice as high as Cambodia and three times as high as Thailand. The taxi industry also has a personal business driver and taxi company that use private vehicles, and the background of the service that provides transportation to individual motorcycles before Grab motorcycle can be seen as the cause of the rapid growth of vehicle sharing service in Vietnam without entry barriers. Before the introduction of shared platform service, the barriers to entry of shared service were low because the individual and private transaction market and taxi industry already coexisted with the mobile means using private lyowned cars or motorcycles in the market. However, the existing taxi brand was able to coexist because of the high reliability of the users due to the distrust of the individual business operators, but the use rate of the taxi industry has been lowered due to the introduction of shared service and the high confidence in the mobile fare.

Vietnam also has a ride sharing market, Uber opened its first market and Grab started service in 2017 and competed in the market first and second place. In 2018, Grab acquired Uber and ranked first in the Vietnam Ride Sharing market, while the conflict with 17 taxi unions in Vietnam is similar to Korea. In December 2018, Vietnam's largest taxi company, Vinasun, filed a lawsuit against Grab for damages, and the court ruled Hanhwa for 230 million won. (KBS NEWS, 2019) Grab appealed for the ruling, and is in the process of an unfinished fight. This is because the business has been expanded to GrabPay, a mobile payment system that makes it easier to use Grab Food, Grab Express, and services, in addition to mobile services. It will be difficult to define clearly by expanding the area of public transportation integration platform including Grab Cycle, Grab Now, Grab Reward, etc., targeting O2O largest companies in Southeast Asia.

### Indonesia

Recently, smart mobility applied with information and communication technology is emphasized in the process of smart city creation in Indonesia (Sen & Yadav, 2017: 105), especially interest in smart mobility associated with public transportation in frastructure is increasing (Misdraet al., 2017: 135; Sen & Yadav, 2017: 105) 'Go-Jek' and 'Grab' are ranked first and second in the market. We're competing. In 2017, the Indonesian government announced regulations by allowing driving sharing services but mandating operating conditions and service price adjustments for fairness in competition with the taxi industry, but the government relaxed regulations again following the Supreme Court ruling that these regulations violated the principle of freed democracy market. (Seoul Digital Foundation, 2018)

### Singapore

Singapore is a successful case where the ridesharing service and the taxi industry coexist in harmony. The ride sharing service company is classified as a technology company and minimum regulation is implemented.



As a result, the Ministry of Land Transport Authority of Singapore presented a new license for P2P operation in 2019. There are two types of licenses: Street-Hail Service Operator License (SSOL) which is available directly from the road without reservation, and Ride-Hail Service-Operator License (RSOL) which is acquired by the rider sharing service provider who can make use of the vehicle after reservation through platform. (Land Transport Authority of Singapore, 2019) The government manages the number of vehicles in the license-acquisitioning operators and enforces differential regulations depending on the size and degree of the service. (Seoul Economy, 2019)

## Conclusion

The new sharing platform is a field that attracts attention all over the world and has a range of existing wages, goods, and services and expanded the range of existing wages, goods, and services. (Schor, Lee, J.M et al, 2016) When we investigate the driver and partners of Uber as well as the user satisfaction in the transportation field, we can find that Hall and Krueger, 2015 are very satisfied with the flexible working hours and compensation for working hours, and it is positive for the service and service environment of users and suppliers. When we saw the speed of entering the market of new shared transportation service that filled the needs of both users and providers, it showed a rapid growth and market formation. Also, as the service which has been growing with the development of ICT, there is a space where the social media function to communicate with each other in the service application, and the user is developing trust in the service by interacting with each other. The regulation of the industry is the basis of the industry, and the industry can grow stably on the right regulation. Ride sharing has developed transportation in cities that are growing rapidly, especially in Vietnam and Indonesia in Southeast Asia, because it can solve the severe traffic congestion in the city center and the lack of public transportation. However, in the case of each country, the regulation surrounding the service and the extreme opposition of various stakeholders have been seen as a hindrance to service growth. The case of Vietnam was typical, and many ridesharing companies such as Uber and Grab did not simply provide mobile services, but food delivery (Grab Food, Uber eats etc.). As it is expanded to various services such as logistics mobile service, it is not clear which criteria should be viewed from existing business. Shared economy is a threat to existing industries in the way of reusing idle resources. Because it is a new business, existing laws and regulations are not suitable and should be revised to the regulations suitable for sharing economy. (Kathan et al., 2016) Singapore, a typical success case, is coexisting harmoniously by recognizing the Ride sharing company as a new industry through the government's intervention, protecting the existing taxi industry by revising the license of the operator and managing the number of acquisitions, and safely regulating new businesses that enhance user's convenience.

Although various shared economic models such as shared mobility services, housing and living goods are showing great growth, most users are still staying in 'Early Adopter'. Expanding these users to 'Early Majority' is an important issue in expanding shared mobility services. (Glind, Roe, 2017) Services cannot develop simply by the relationship between provider and user, and require a macroscopic view of service and the industry. When analyzing the current ride sharing service, it is an industry that has grown due to the needs of users and it is a service that uses applications. Therefore, the communication between users and companies, users and users is smooth, but the regulation is not clear. It is necessary to clearly define this service and to regulate the new industry properly. Also, it is expected that it will be able to verify the service provider and improve the trust in the service and develop it into a true sharing service.

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- Resumen:** La tendencia de consumo de la sociedad moderna está cambiando de la propiedad al uso compartido, y del consumo excesivo al consumo cooperativo. Basándose en esto, los servicios de la economía colaborativa se aplican en diversos campos como el espacio (por ejemplo, Airbnb, We work), el transporte (por ejemplo, Uber, Didi Chuxing, Grab, Lyft, etc.) y el aprendizaje (por ejemplo, Coursera). Con el aumento de la accesibilidad a la información debido a la popularización de los dispositivos inteligentes, la economía colaborativa se está extendiendo rápidamente. Especialmente, en el caso del mercado de automóviles compartidos, se espera que se convierta en una megatendencia en el futuro a medida que se completen las carencias del mercado existente. Este estudio pretende examinar la dirección del futuro modelo de desarrollo como diseño sostenible.
- Palabras clave:** Movilidad - Economía colaborativa - Viajes compartidos - Diseño de servicios - Asia.
- Resumo:** A tendência de consumo da sociedade moderna está mudando de propriedade para compartilhamento, e de consumo excessivo para consumo cooperativo. Com base nisso, os serviços de economia compartilhada são aplicados em vários campos como o Espaço (por exemplo, Airbnb, We work), transporte (por exemplo, Uber, Didi Chuxing, Grab, Lyft etc.) e Aprendizagem (por exemplo, Coursera). Com o aumento da acessibilidade da informação devido à popularização de dispositivos inteligentes, a economia do compartilhamento está se espalhando rapidamente. Especialmente, no caso do mercado de compartilhamento de automóveis, espera-se que se torne uma mega tendência no futuro, uma vez que a lacuna no mercado existente é complementada. Este estudo tem como objetivo examinar a direção do modelo de desenvolvimento futuro como projeto sustentável.
- Palavras-chave:** Mobilidade - Economia Compartilhada - Ride-sharing - Projeto de Serviços - Ásia.
- (\*) **Yoo Chaemoon:** Kookmin University Experience Design (Interaction) Master, 2018 - Kookmin University Industrial Design, Bachelor, 2015.