Innovations of bike sharing industry in China
- A case study of Mobike’s station-less bike sharing system

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Abstract

Through over forty-five years of development, bike sharing is not a fangle in Europe. But it becomes a popular topic in China in recent two years. The Chinese startups exert IoT technologies and GPS modulars in shared bikes and launched the world’s first station-less bike sharing system. This new bike sharing system gains in popularity, and develops dramatically all across China. In addition, the leading bike sharing service providers such as Mobike, got over $300 million investment since the start of 2017, which caught the attention of the public. More and more venture capitalists want to touch this new tempting pie. This paper mainly focus on investigating what are the roles of this new bike sharing system in urban mobility in China specially in Shanghai and its influences in the society. Meanwhile, the socio-technological innovations of the new bike sharing are explored together with the application of different theoretical frameworks, such as Porter’s Five Forces and system thinking. This paper also tempted to fill up the gap in the literature that describing the missing part of smart bike sharing business - using the stationless bike sharing business model, involving a discussion of its pros and cons. In order to give more detailed insights about the new bike sharing industry, we choose the world’s first station-less bike sharing service company - Mobike, as our case study object to investigate the revolutionary bike sharing system in Chinese major cities, specifically in Shanghai - the representative megacity of China. Conclusions and future development suggestions are provided in the end of this paper so that the stakeholders could have some references for further development of bike sharing industry.

key words: bike sharing, innovation, urban mobility, system thinking, porter’s five forces, Mobike, China
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1. Introduction

1.1 Background

Back in 1980s in China, there were barely 4-wheel cars running on the streets. Because of the scarcity and high price, private cars are considered as luxury products and represent higher social status. Bicycle, at that time, is the major private transportation tool. After over three decades of development, the civil motor vehicles increased drastically. In 1985, there were less than 20,000 private vehicles across the whole nation (NBSC 2004). In 2015, the number private-own cars reached about 125 million (Chinadaily.com.cn, 2016). When everyone can finally enjoy the ride with his or her dream car, now the society has to pay the price: traffic congestion, noise pollution, air pollution, lacking of parking space, increased gasoline and diesel price etc. When these issues become more and more serious and cannot be neglected, people have to figure out the way to solve them. And then, all of a sudden, the bike sharing is booming and bike riding becomes popular again.

Right now, bike sharing programs can be found at almost every corner. This concept has swept across the globe in just a few years. In contrast to the 90s and 00s, which bike represents lower class, bike riding in recent years is the synonym of cool, fashion and sporty among millennials. In 2015, the number of shared bikes hit one million, and nearly 900 bike sharing systems operated worldwide (CityLab, 2017).

In 2008, China launched its first bike-sharing program in Hangzhou with 2800 bikes. It soon developed to be one of largest bike sharing systems in the world, with more than 78000 shared bikes (CityLab, 2017). At the end of 2014, there were 235 cities which operated bike sharing programs in China, comprised fleet of 747400 bikes in 28000 stations (Meddin, 2014).

Although the public bike sharing systems seem functional as a perfect solution of promoting the green transportation in short distance, unfortunately the availability and convenience of this system become a barrier for highly adoption among citizens in China due to the large and inappropriate scale of Chinese megacities. It is not that easy and convenient to rent and return a public city bike. The procedure is too complicated and the availability of public city bikes are too low compared to the enormous city scale. Is there a better way to combine the concept of bike sharing but to offer a more flexible system which is available for people to use while there is a need? The answer is yes. Mobike, as the first station-less bike sharing company - the pioneer who innovated the bike sharing industry in China, took the initiative to develop a bike that can be located and rented through their Mobike App, and returned to any public bicycle parking area. It perfectly solves the last mile problem and incarnates a revolutionary lifestyle. After one year’s development, dozens of similar station-less bike sharing programs popped up in more than 50 Chinese cities, formed up a new scenario of Chinese city
landscape images. This seems perfectly filled up the gap of lacking efficient short distance transportation and promoted better adoptions of public bike sharing systems in China. But the same time it also brings negative social effects - mainly problems lying in ethical aspects and management of the bikes - which might become barriers for future developments in urban mobility. Therefore good strategies which help improving negative social effects are necessary for creating better social sustainabilities. Specific strategies are discussed in this paper, within the case city background - Shanghai and the case targeted company - Mobike.

In Chapter 2, we elaborate three concepts related to our research - urban mobility, traditional bike sharing industry and sustainable urban transportation. In Chapter 3, the theoretical frameworks - system thinking and porter’s five forces, will be introduced. Chapter 4 describes the methodology we used in this paper, and the limitations as well as the ethical issues. In the Chapter 5, we use the theoretical framework to analyse the industrial dynamics of new bike sharing industry. In the case study section, we introduce our case study object - Mobike and its business model and development in Shanghai. The social and technical innovations of Mobike will be also explained. Theoretical frameworks and tools are employed in this chapter to analyze the selected case in case study chapter, to be able to offer a clear insight that what kind company it is, what innovations it promoted, opportunities and challenges it is facing, what implications that we can learn from this case and so on. In Chapter 7, we summarize the results from abovementioned chapters and discuss the future development of new bike sharing in China.

1.2 Research questions
According to the thorough investigation among the relevant literatures that we can access to, with consideration of filling up the gap in the current research literatures about the station-less bike sharing system, we developed our main research questions and subquestions as follows:

Main question:
What are the roles and impacts of the new bike sharing system - the station-less bike sharing system in urban mobility across Chinese large cities?

Subquestions:
- What does the current situation of Chinese urban mobility in large cities? (Status quo, problems/weakness)
- How does the new bike-sharing system work?
- What is the impact of new bike sharing system in urban mobility aspects?
- What are the consequences of new bike sharing in Chinese society specially in large cities? Does it help improving sustainability in Chinese major cities which have implemented this system?
1.3 Objectives

This paper mainly focus on the development of the new bike sharing system and investigate its impact on the urban mobility in China, especially in large cities such as Beijing and Shanghai. This paper also investigate and analyse the socio-technological innovations of the new bike sharing system in China and its role in the public transportation system in order to give readers clear insights of the new bike sharing industry. For example, investigating the factors that influence the adoption of the new bike sharing systems in China; analyzing the selected company and the new industry using frameworks such as system thinking and Porter’s five force; identifying underlying issues which are brought by this phenomenon, etc.

The target and possible readers of this thesis are managers of bike manufacturing companies, managers of the companies who supply the manufacturing materials, managers of technology companies especially the technology focusing on Internet of Things (hereinafter, IoT in short), city planning department, department of Transportation, entrepreneurs who focus on IoT, transportation and cloud technology, researchers who focus on sustainable transportation, entrepreneurship, venture capitalists and Chinese economists.

1.4 Scope and delimitations

This study is descriptive in discussing the current statement of urban mobility in big cities in China and the problems need to be addressed, with focusing on the development and the impact of the new bike sharing system in urban mobility in China. By providing the comparison of the new and traditional bike sharing systems, together with undertaken thorough analyses using different relevant business tools, we try to reveal the innovative parts as well as the shortcomings in the new bike sharing system, with a conclusion that what can be improved in the future within the bike sharing industry in China.

Mobike, being the first startup in China who initialized station-less smart bike sharing scheme, is one of the most innovative companies who acts as a leading company within the new bike sharing industry. Studying the development of Mobike would give us a better understanding and a more reliable whole picture of the industry. We selected Shanghai as our case study city because it is not only the first city in China that adopted Mobike’s station-less bike sharing system, but also a city well organized under certain development strategies regarding the new bike sharing system. In this paper, the research data was delimited to informations and articles available before May 2017. Therefore, the data collected in this paper are subject to this time limit and mainly focusing on the development of Mobike’s station-less bike sharing system in Shanghai between April 2016 to May 2017.
2. Literature review

As the station-less bike sharing systems appeared in the market in the last two years in China, there are still no/less literatures available today that researching the role and impact of the new bike sharing system in the urban transportation across large cities. Most of the articles/dissertations we found are discussing the impact of traditional bike sharing system in urban mobility and samples of case studies towards different city bike sharing systems with fixed stations. We assume this is a literature gap to be filled up with up-to-date informations collected from business fronts with theoretical analyses. Meanwhile, we tried to learn from the traditional bike sharing related literatures to form up applicable theoretical frameworks for our research. This paper presents the literature review within three major topics related with our research - urban mobility, traditional bike sharing industry and sustainable urban transportation.

2.1 Urban mobility

Bouton et al., (2015) mentioned in their article “How to make a city great” that 60% of the world’s total population are going to live in the cities by 2030, increased by 10% from today’s number. The cities will be more congested and facing more challenges such as pollution, scarcity in land use, noises, and traffic jams etc. But the same time, the society requires better urban mobility system to support the daily traffic transportation, which demands better urban infrastructure to be planned. According to Macário (2007), “the urban mobility system is formed by infrastructure (including superstructure and intermodal links), networks, services and agents, each of them by itself a complex whole that requires further decoupling.” As we can see today, most megacities in the world are experiencing mobility issues, particularly in China. In this paper, we define urban mobility as the aggregated result of the multiple decisions (and factors conditioning those decisions) taken by individuals and economic agents as an answer to their requirements of displacement of people and goods. Conditioning factors are: the location of social and economic activities in the urban defined spaces; the working hours of the different activities; intensity of opportunities for social interaction; other cultural elements that contribute to define the pattern of social relations in a city.

Understanding a city’s mobility system will help us to understand the underlying forces and how they interact (Bouton et al., 2015). McKinsey Center for Business and Environment has developed a framework for understanding urban mobility, displays in Figure 1. This framework divides the system into seven factors that are essentials to keep the urban mobility system work efficiently and effectively. These factors are mapped into two groups: one is called ‘shaping the system’ which including three factors - policies and regulations, land use and urban design, consumer preferences and behaviors; the other one is called ‘delivering mobility’ which contains four factors - privately owned vehicles, walking and bicycling,
public transit, and new mobility services. These are the core value of this framework. Apart from the essential factors, three enabler of urban mobility system are also depicted in this framework, which are technology, new business models and financing. Therefore, to accelerate the transformation of urban mobility system to a better one would require the emerging of technological innovation, new business models and financing to support. To better shape the system would require all the efforts from improved government policies and regulations, better land uses and considerable urban designs, and influenced by consumer preferences and behaviors. For mobility delivering methods, innovative new business models and interruptive or incremental technological innovations are the key enabler that help evolving the system, while financing is always the fundamental part of every business development and societal revolution. Bike sharing system can be regarded as the combination of bicycling and new mobility service based on sharing economy concept. And station-less bike sharing is the further evolved version from the traditional bike sharing mobility system, while smart technological development is a premise.

![A framework for understanding urban mobility.](image)

**Figure 1 - A framework for understanding urban mobility (Bouton et al., 2015)**

### 2.2 Traditional bike sharing industry

The traditional bike sharing industry is referred to the bike sharing industry that has not implemented station-less concept in their bike sharing schemes in this paper. Therefore, the traditional bike sharing is that users can rent the bike from one of the bike sharing stations, and return it either to the original station or another station in another location after using them. And they have to pay the time-based rental fees. In recent years, european cities are looking for the ways of increasing bike usage and reducing adverse environmental influences.
Therefore, bike sharing programs have grown rapidly (Midgley, 2009). In addition, the development and introduction of smart technology has helped to solve theft and vandalism problems of previous program. And bike sharing has become popular, especially among young people (Midgley, 2009).

The challenge of implementing bike sharing scheme is that “most bike-sharing schemes need to be financially backed by a large transport operator or by public resources, either through direct funding or indirectly through Public Private Partnerships (PPPs)” (Midgley, 2009).

2.3 Sustainable urban transportation

According to Macário (2007), urban means “a series of interrelated dimensions, among which: population size and density; spatial, economic and social organization; variety of functions and institutional interactions; social values of population or degree of “civility” (often also referred as “urbanism”), etc.” The European Commision (2001) defines the urban transportation system which “... provides access and mobility for people and goods, linking origins and destinations both internal and external to the urban area. It has many elements, including: 1) public transport (collective transport); 2) non-motorised transport (pedestrians, cyclists); 3) freight and business traffic; 4) motorised private traffic. ... The targeted objectives for urban transport are to fulfil the demand for accessibility with an efficient and quality service, whilst at the same time promoting sustainable patterns and levels of traffic that take account of economic, social, environmental and safety concerns.”

Here, in this paper, we define the urban transportation that offer means connecting two destinations for citizens within internal urban area. The main elements include: public transport, non-motorised transport and motorised private traffic. According to (Kayal, Singh and Kumar, 2014), the new concept of sustainable transportation nowadays is not only about consuming lesser energy and lower exhaust gas emissions. It is also about the economy, society as well as the transportation mobility and accessibility for the people. The sustainable transportation would be usage of clean energy vehicles such as biofuel cars without causing problems of maintenance, operation and parking cost of the vehicle.

Cycling, a fast, cheap and non-congesting form of transport as well as the green option for the short distance trips in urban area, can be seen as one of the sustainable transportation methods in urban mobility. It can moderate urban mobility problems. What’s more, cycling meets the needs of short distance transportation within urban area and helps to solve the problems of first/last mile transportation.

Urban transportation in China

China, one of the world’s largest developing country, has experienced fast economic development since economic reform in late 1970s. However, the rapid growth creates rapid urbanization. The urbanization rate in China had been raised from 18% in 1978 to 56.1% in
The top municipalities such as Beijing and Shanghai became the advanced urbanized society with more than 75% urbanization rate (ChinaDaily, 2012). The rapid growing population in urban area increases the demand for transportation. Consequently, the transportation related issues such as the rapid increased traffic volume, congestion and environmental pollution and rapid increased energy consumption become problematic. In addition, the current transportation infrastructure and networks have not enough capabilities to support the rapid growing demand. The serious transportation issues become unneglectable and urgent as they influence the citizen’s daily travelling and quality of life. One of them is the first/last mile problem.

Figure 2 illustrates the first/last mile in transportation. First mile represent the passenger’s travel journey from home location to metro or other public transport stops; and last mile means the travel journey from metro or public transport stops to workplace or other final destinations. The appear of online hailing service like Uber and Didi chuxing in recent years seems to solve the first/last mile problem. But in reality, it doesn't work well, especially during the rush hour, service cars also stuck in the traffic jam and people need to spend more time to reach their destinations. The other solution is the traditional bike sharing. However, the lack of flexibility of stationed bike sharing, complicated application process and undersupply of shared bikes during rush hour make the bike sharing unattractive to the customer. In addition, the high cost of the infrastructure such as the docking stations and the distribution of bikes as well as the theft and vandalism issues also make bike sharing an expensive and unsustainable for governments and operators.

Figure 2 - First mile and last mile problem in transportation (KING, 2016)

3. Theoretical frameworks

The transformation in bike sharing industry is showing its growing importance in our daily life, as it dramatically changed our life style. There are different theoretical frameworks helping us to analyze this transformation. First, System thinking theories in industrial dynamics by Blomkvist and Johansson (2016) is introduced in this chapter. In addition, the
practical industrial frameworks - Porter's five forces is employed to examine the different aspects of the industry.

3.1 System Thinking

Thomas P. Hughes introduced the Large Technical Systems (LTS) theory in beginning of the 1980s. He suggested that a large technical system includes not only technology but also include some form of cooperation among its users. Generally, most of the industrialized countries are rely on infrasystems. People live in modern life cannot live without them. We need them for basic necessities of life such as food, transportation, communication, power, water, etc. The large systems are consist of technical artifacts, institutions and actors and those components are connected and interdependent with each other (Blomkvist & Johnansson, 2016). According to Hughes, each components of the systems can be seen as sub-system. It is also mentioned that the LTS is not a system that started as centrally planned system, sometimes the components were not linked at the beginning. The centralization and growth of the system generally happens in a later phase, since the market mechanisms such as the economies of scale and the consolidation of the whole industry around the system, often lead to the creation of a monopoly market. (Blomkvist & Johnansson, 2016) In this paper, we use the LTS method to analyse the new bike sharing system in China.

To analyze the system properly, we should conclude not only technical but socio-technical perspectives. There is popular definition of socio-technical system presented by the sociologist Bernward Joerges - “Such a complex and heterogeneous system of physical structures and complex machineries 1) whose material components are integrated or ‘linked’ over time … and, 2) supports or facilitates the operation of a large number of other technical system, the organizations thus linked together.” The idea behind this definition is that in a LTS, each component or sub-system of the large system is linked through internal connections, and can not be separated since they support each other and complete each other in the performing process. For instance if one rents a bike(component/sub-system), he/she needs support from the infrastructure (road, parking area, etc) and policies (traffic regulations) that enable us to ride the bike smoothly and safely to our destination.

The socio-technical system can be described with the S-curve (Figure 3), and divided into 3 stages: build up - expansion - maturity (Blomkvist & Johnnansson, 2016). It is imaginable that in the final stage - when the system is growing to mature, it will be hard to change or influence the system any more, and the expansion of the system will be slowed down since the market is approaching saturation (Hughes, 1983). But on the other hand, in the first two stages, it is possible for the innovators to create positive links between the subsystems and to form a strong infrasystem. For example in the station-less bike sharing industry, when the adoption rate is low, it is not very convenient for the user if there is no one sharing the bike in the neighborhoods, and the whole sharing system will not be activated.
3.2 Porter’s five forces

The Porter’s five forces model created by Michael Porter in 1979, analyze five key forces that affect an industry. Porter (1979) suggested that the competition in an industry is influenced by five forces: threat of new entrants, bargaining power of suppliers, threat of substitute products or services, bargaining power of customers and the current competitors. The profitability of an industry depends strongly on those forces. Knowing the underlying source of competition pressures is, of course, crucial for company’s strategy making.

The new entrants brings new resources and production capacity into an industry, and long for gaining market share in this industry. It causes competitions of raw material and market share between new entrants and incumbents. Consequently the competition reduces the profitability of incumbent, even threaten companies’ subsistence and development. The seriousness of the threat depends on two factors, one is the entry barriers and the other one is the expectation of the reaction from existing companies about the new entrants. According to Porter, there have six major entry barriers: economies of scale, production differentiation, capital requirement, cost advantages independent of size, access to distribution channel and government policy.

Suppliers influence companies’ profitability and product competitiveness through raising price and reducing the quality of purchased goods/services. The suppliers is powerful when: the products/services they provide are the important component for the products of the industry; the products/services they provide account for a large proportion of the product costs and the products/services they provide have huge impact of the product quality of the industry. And the suppliers have powerful bargain power if they have following characteristics: 1) product differentiation, they provide unique product so that the switching cost is high for the purchasers or it is hard for the purchasers to find the substitute goods; 2) diverse customer group, the industry is not the only one or the important customer of the
suppliers; 3) there are no competitive products or substitute products that the industry can purchase.

On the other side, customers also influence the profitability of the companies through demanding lower price and requiring higher quality of the services. The consumers have powerful bargain power if they: 1) purchase large volume of products; 2) the purchased products are standardized and undifferentiated; 3) the industry consists of small size enterprises.

Substitute products also have impact of the profitability of the industry- It limits the potential of the industry (Porter, 1979). Two companies in different industries, their products might be each other’s substitute product, thus become competitors. The price and the potential of the profitability of the industry are confined by the substitutes. With the entrance of the substitute products, incumbents have to improve the product quality, reduce production cost or produce unique products, otherwise their sales volume and the profitability will have negative impact. In addition, the competitiveness of the substitute product depends on the customer’s switching cost. The lower price or the higher quality substitutes products have, the lower the switching cost.

![Porter’s five forces](image)

Figure 4 - Porter’s five forces (Porter, 1979)

The intensive rivalry are influenced by flowing factors: 1) equal/similar size and power between competitors; 2) slowly industrial growth; 3) lack of product differentiation or switching costs; 3) high fixed costs; 4) high exit barriers; 5) capacity surplus; 6) diverse strategies of competitors.
This model will be used in the current study, to understand the industrial structure and the level of competition in the bike-sharing industry in China.

4. Methodology

This chapter introduces the methodologies of this paper, and divided into five points as follows:

4.1 Identification of paradigm - interpretivism

This paper is an interpretative research on the statement of the world’s first station-less smart bike sharing systems in China, with focusing on the socio-technological innovations. The innovative station-less bike sharing system aiming to solve the last mile transportation problem by providing a solution using an App - pick up a bike using the App and then return to any public bicycle parking area. As it is a brand new innovation and influences in a large extent to both social and technological development within bike sharing industry, interpretivism research methodology is therefore more suitable for us to interpret the social and technological phenomenon behind the innovations.

4.2 Methodological approach and methods

Throughout the research process, we started from reviewing urban mobility and traditional bike sharing industry literatures, also investigated sustainability issues regarding urban transportation, specifically in China. It is clear that there is a gap in the literature describing the new bike sharing system which has swept across China, and showing its strong expansion ambitions. Under this condition, several research questions are defined based on industrial management theories. Then different industrial dynamic frameworks are selected according to the relevance, such as systems thinking and porter’s five forces. A detailed case study of Mobike will be presented using explanatory method in the next chapter. In the case study, we took a close look at the current statement of the bike sharing industry in Shanghai as a pioneer city which adopted the new bike sharing system and the ongoing innovations within the industry. The industrial frameworks and relevant business analytical tools have been applied to examine the transformation of the bike sharing industry in China, as well to assess the different dimensions of the innovation. At the end of this paper, we present our conclusions and some future development suggestions developed based on our analyses.

4.3 Data collection and analysis

Qualitative data of this paper are mainly collected through online resources, for example online news channels including official news platforms of targeted company. For the industrial dynamic analysis, we mainly applied the system thinking framework - LTS to give a whole view and assessment of the new station-less bike sharing industry in China. For the
case study analysis part, we select major industrial business frameworks such as Porter’s Five Forces and Marketing Mix(4Ps) to analyze the collected qualitative data. All the analytical tools and frameworks are selected upon relevance.

4.4 Limitations
Due to the limited time and limited data available of the startups, it can lead to misinterpretation of the data and eventually cause biases of the research results. And the selection of the startups within the bike sharing industry might be somewhat providing us with fault or subjective informations. Planned personal interviews are not executed within the time limit since we are still waiting for responses from the targeted company. Therefore a backup plan is carried out - we reviewed all the interviews that has been published online from the selected case company - Mobike, as a source to provide us all the important data that we actually needed. All the data we collected are subjected to the thesis time limit - only updated by May 2017.

4.5 Ethical issues
For all the data that we collected online we will provide the sources; In case of potential interviews, they will be carried out on absolute voluntary participation basis; we will also address the confidentiality and anonymity issues for interviewees who are not willing to state their identity. In case of interviewing a significant person who has influential role in this industry, we will make sure that this person agrees with the terms of using his or her name and we will get his or her permission about using any of the opinions before publishing it. And since the station-less bike sharing economy is a relatively new business to the researchers, care is taken to collect data that is as reliable as possible.

5. Industrial dynamic analysis
In order to understand and analyze the industrial dynamic and innovation of new bike sharing industry, we use one of the system thinking framework - Large Technical Systems (LTS) which was introduced by Thomas p. Hughes (Blomkvist & Johnansson, 2016).

The development of new bike sharing or so-called station-less bike sharing in China rocket, most of them started their business in 2015. After only one year of development, now only Shanghai has over 450.000 shared bikes and at the last 4 months of 2016, there has over 9 million active bike sharing users from Ofo and Mobike, which are two of the major bike sharing service providers (Yang and Liu, 2017). And within two years, China leads the world’s largest bike sharing scheme (Figure 5). In 2016, there are more than 20 bike sharing service providers launching on the market and bike sharing enter more than 50 cities (Sohu, 2017). The new bike sharing step to the expansion stage.
Figure 5 - China leads the world in bike-sharing schemes (Yang and Liu, 2017)

Bike sharing has entered in China since 2008, it is not a new topic. But rising of new bike sharing with radical innovation challenges the incumbent system even the whole transportation ecosystem. The system change, according to Utterback (1994), called disruptive reverse salients and this disruptive reverse salients, is caused by external actors and the radical innovation produces competing system. Joerges (1988) suggested that “...independent inventor-entrepreneurs could be shown to specialize in identifying critical problems and related ‘reverse salients’ on broad technological fronts”. According to Hughes, system change is caused by new technology, new/change market conditions, environmental concern, policy change and institutional innovation or lack of primary products.

- New technology: the ubiquity of smart phone and mobile payment, development of IoT technologies trigger the innovation of bike sharing system. First of all, the fast growing of mobile payment changes the Chinese marketplace. China’s mobile payment business saw 25.71 billion transactions in 2016, an increase of 85.82% and a total amount of 157.55 trillion yuan (CIW Team, 2017). In 2020, the Total mobile payments volume in China will predictably reach $6.3 trillion (Bakker, 2016). What’s more, the development of cellular IoT technologies such as CAT-M1 and NB-IoT, enabled service providers to track and locate the sharing bikes accurately even in the underground parking lots; it also provides the possible solutions of theft issues and reduces the risks of theft, vandalism in bike sharing process Moving forward, the new technologies allowed each individual bike communicates with the server and therefore provide more flexibility to the users and also significantly reduce the waiting time to unlock the bikes and improve users experience (Ericsson AB, 2017).
New/changed market condition: urban residents are eager to find the solution of the first/last mile problem, whereas, the complicated process of stationed bike sharing makes the incumbent bike sharing unattractive. In addition, the thriving of riding-hailing services such as Uber and Didi chuxing are only tinkering on the edges. There has a niche market with large potential that waiting for entrepreneurial warriors to break the ground.

Environmental concerns: The price of rapidly growing economy is pollution. The increasing heavy-industrial production, excessive deforestation etc, damage environment and ecosystem. The most obvious consequence is the dirty air, known as smog. Most of the industrial cities and major cities such as Beijing and Shanghai suffer from smog. Nowadays, Chinese society becomes more sensitive and responsive towards environmental issues, thus chinese customers are more concern about the environmental effect when they purchasing products, especially young consumers. According to the study of green purchase intention from Chen (2013), the young consumers in China are showing more interest in green products and more concerning about environmental issues and put into action.

Policy Change: A new research from University of California shown that about 1.6 million people in China die each year caused by heart, lung and stroke problems because of polluted air (the Guardian, 2015). The Chinese government has declared many times to fight the war on pollution to improve air quality. The Chinese government plans to invest 47.858 billion RMB ($7.662 billion) to combat air pollution in the next five years, with focuses on coal-fired pollution, vehicle emissions, industrial pollution and dust (Chinadaily, 2014). In the end of 2014, Government has pulled 6 million highly polluting vehicles off the roads and scraped all of them to reduce air pollution (Chinadaily, 2014). Big cities such as Beijing and Shanghai began to restrict car ownership and set limitation of driving time. In addition, To combat the air pollution and public health threat, Chinese government encourage people to use green transport methods such as small-displacement vehicles, clean-energy vehicles, bikes etc (李, 2009). What’s more, Chinese government also support enterprises to develop new technologies in order to reduce transport energy consumption (李, 2009).

Institutional Innovation: the emerging of stationless bike-sharing startups such as Mobike and Ofo flooded in China. Unlike the traditional bike sharing around the world, the bike sharing startups launch their stationless shared bikes that users can pick up and drop anywhere. The innovation of the bike sharing solves the first/last mile problem of the public transportation system.
6. Case study of Mobike in China

China used to be called “the kingdom of bicycles” before cars became affordable and popular. With the development of modern transport system, all kinds of commuting methods completed each other and connect people with their destinations. The innovative station-less bike sharing system aiming to solve the last mile transportation problem by providing a solution using an App - pick up a bike using the App and then return to any public bicycle parking area. Mobike is the first startup company founded in 2015 which providing station-less bike sharing service using IoT technologies and smart solutions based on big data support. Mobike’s first bike sharing project was launched in April 2016 and now operates in more than 50 cities in China, with Shanghai alone has more than 100,000 station-less smart bikes from Mobike. (Mobike.com, 2017) There has never been such a dramatic change for short distance transportation in bike sharing industry in Chinese big cities. After Mobike established itself in the market, dozens of copycat companies followed this trend and tried to establish themselves in bike sharing industry using the same concept and similar business model. The reason we chose the development of Mobike as our case study among all the other bike sharing startups, is that Mobike is the first company that successfully integrated station-less bike sharing concept with IoT and GPS technologies in China, meanwhile keeps focusing on social and technological innovations with rapid product iterations, also carries a real sense of social responsibility.

6.1 Introduction of Mobike

Mobike, created by a Chinese startup called Beijing Mobike Technology Co.,Ltd in 2015 in Beijing, is the first fully station-less bike sharing service in China and the biggest smart bike sharing platform in the world (Mobike.com, 2017). It is a bike sharing service “fulfill urban short trips conveniently, anytime, anywhere, by combining innovation and today’s IoT technology” (Mobike.com, 2017). The Mission of Mobike is to “provide an affordable means of shared transportation for convenient short urban trips, while reducing congestion and our city's carbon footprint that improves the quality of city life” (Mobike.com, 2017). Currently it operates over 50 major cities in China, and expanded its business to Singapore. In 2016, it launched 100,000 bikes in Shanghai, which made Shanghai the world’s largest bike-share city (News.163.com, 2016).

Mobike creates the world’s first smart bike sharing model. It develops its own patented smart lock combining GPS and telecommunication module as well as new generation of IoT technology. Users can locate the nearby shared bikes anytime and anywhere through using App downloaded in their smart phone. After cycling, users can drop the bike wherever within appropriate parking area, and then lock the bike and pay the rental fee via mobile phone.
There is no need to return the bike to the original area nor find the specific bike station (Mobike, 2017).

Mobike creates the trend of bike riding, and spreads the concept of “make the bikes back to city”. Its bike sharing service provides the solution of green and sustainable urban transportation and flexibility. This young and energetic company has raised more than $300 million since 2017 and became the unicorn of the bike sharing industry (Russell, 2017). In early January, Mobike acquired a $215 million Series D round by Tencent and a strategic investment from Foxconn, which breaks away from the convention that startups can’t survive after Series C. In February, it received another strategic investment from Singaporean company Temasek, which is good for Mobike international expansion plan (Ma, 2017).

6.1.1 Business model of Mobike

According to Osterwalder and Pigneur (2010), business model, “describes the rationale of how an organization creates, delivers and captures value”. A business model is composed by interconnecting factors that creates and delivers value. A good business model explores the potential value from technology and use it to create economic value. It gives a guide to companies that they should not only focus on product but also the customers’ need, as well as the market environment. Introduced by Osterwalder, the business model canvas illustrates company’s business model systematically and shows the logic of how companies make money. It consists of nine building blocks: key partners, key activities, value propositions, customer relationship, customer segment, key resource, distribution channel, cost structure and revenue stream. In this section, we use business model canvas to analyse Mobike’s business model, in order to understand and have a deeper look of the company’s strategy management and marketing plan.

As generally acknowledged by most researchers in bike sharing economy in China, the most innovative part of the Mobike’s business model lies in the deposit from the large number of user groups. The revenues from the service provided by Mobike - hourly based rental income - could not bring in large amount of cash in short term, which is not so tempting for investors to take in heavy capital investment required in the starting phase, even the business model itself showed a sustainable growth ability to have a healthy cash flow and gain a considerable profit after a four-years operation period.

The first generation of Mobike charges rental service for 1 RMB (equals to 0.14USD) per half an hour, and the second generation of Mobike - Mobike lite - charges 0.5 RMB (equals to 0.07USD) per half an hour. The bikes are designed according to four years free maintenance standard. If each bike can be leased out at least two hours per day, it means an average of 4380 RMB gross profit can be secured on each bike for a four-years operating period. Still it is a very conservative way of calculating the profit margin, but it gives a clear vision of the revenue possibility.
Besides, before the customers can start using the bike sharing service, a deposit of 299 RMB is prepaid to Mobike. According to Weiwei Hu - founder of Mobike, Mobike has attained 3 billion RMB (equals to 435 million USD) as deposit money after 9 month operation in China. This considerable sum of “safety money” enables Mobike to activate other related business activities. Within time, Mobike is able to further cut down production cost and make more profit by gaining more users after business geographical expansion. Today, the number of Mobike’s active user has reached 20 million (SoHu.com, 2017), which means the deposit amount has grown up to almost 6 billion RMB. This is a economical miracle that brings in new ways of business operation possibilities that has never happened before. In our perspective, Mobike is not only a pure bike sharing service company any more, but also a company that has fully financial abilities. But still, this is a bit controversial business strategy since there lies the risks that the government might set up certain regulations to limit the company’s right of usage of this giant sum of deposit. And also it is a cash flow that only accessible under the premise that no/less users withdraw their deposit which is tend to be the case since the current users do need the bike sharing service. Without the great sum of the deposit, the profitability of the new bike sharing business is not so promising. The company itself is still in the search for other revenue models that can guarantee the profitability. Probably in the future, advertising on the bikes or the App would be a good choice for gaining incomes for the company.

To summary, the business model of Mobike is demonstrated in the form of business model canvas in Figure 6.

![Figure 6 - Business model canvas](image)

**6.1.2 Mobike development in Shanghai**

Shanghai, as one of the top-tier cities in China, is the first city that Mobike launched its bike sharing project in April 2016 with 100,000 station-less bikes (Mobike.com, 2017). Since the
purpose of Mobike is to provide the short distance communication service with station-less bikes, it is quite suitable for a city like Shanghai that has a developed network for long-distance transportation but lack of convenient short distance transportation solutions. Mobike provides the last piece solution which is lacking in the city, functioning as the capillary in human body which transport the blood supply to every end in the whole body. According to the data provided by Mobike public platform in Wechat, 90% bike rental activities in Shanghai took place around the metro or bus stops - people use the bike to complete the last/first miles between the metro or bus stops and their destination (offices, schools, homes, etc). During this transition period, it reduced 55% car usage in the city in peak hours (Mobike Wechat news platform, 2017). Surprisingly, biking becomes the most rapid transportation method during peak hours for short distance communication in Shanghai. Consequently, people no longer will be trapped in the traffic jams in the future during peak hours which used to happen quite often, even under bad weather conditions such as smoggy days.

**Local challenges in Shanghai**

It is undeniable that Mobike and other similar bike sharing service companies (for example Ofo and Xiaoming bike) have dramatically promoted bicycle riding rate in Shanghai, but we can also see the ‘side effects’ that are brought by this phenomenon.

Due to the dramatically increased bicycle amount, thousands of new bikes flush into the city, the crowded city pedestrian passages seem to be more crowded now, and the same time it generated series of unexpected ethical issues. For example some users parked the bike in restricted areas, some of the bikes were locked up by extra locks, some bikes were damaged by purpose, ruined QR code on the bike, etc. That is truly a challenge for the bike sharing companies and the city management level to keep both the public areas and the bikes organized in a good way.

Mobike as an innovative company with a great sense of social responsibility, has worked out some good solutions based on technology innovation and continues collaboration with local government. For example, local government in Shanghai has developed recommended parking areas marked by painted white boundaries in the dense urban areas, while Mobike updated their GPS navigation system to adapt this change by encouraging the bike users to park the bicycles in these areas after using. By doing so, the user will gain credit points (1 point per time) through the Mobike App for properly parking the bike as a reward, otherwise the user will lose credit points (20 points per time) if the bikes are parked at restricted places. If one’s credit point is lower than 80, then he/she will have to pay 100RMB per half hour for rental as punishment. On the other hand, other bike sharing service companies such as Mobike’s major competitor - Ofo, did not make much effort in dealing with these social issues or had no effective solutions yet. As a result, the damaged bikes of Ofo can be found everywhere, occupying a lot public space and created a lot social problems, due to the reason that Ofo’s bikes are not embedded with GPS system and their easy cracked single password
locking system. From this point of view, as a start up company who wants to be more competitive in this industry, one need to positively deal with challenges popped up in the business development process; otherwise these challenges might become obstacles and threats in a later phase.

One more interesting thing is that Mobike has set up a reward system for users who help reporting the problem bikes to their customer service team. After reporting problem bikes, the user will gain credit points to their Mobike accounts. A problem bike could be defined as a bike parked in restricted areas, or a bike is not fully functional, even damaged. These users are called Mobike hunters, even though it is still not clear how these credit points could be used yet. But it certainly is a good management strategy to punish users who don’t use the bike according to regulations and help maintaining the bikes in good condition with low cost.

6.2 Innovations of Mobike

Mobike has now launched its bike-sharing service in over 50 cities in both China and overseas already. Its fast expanding strategy is benefiting from its successful innovations. Take a view of the domestic bike-sharing industry, Mobike can be seen as the most innovative company. For instance, the number of patents it applied within recent 2 years reaches to 29 units, which includes PCT international application. And the authorized patents are 17 units. (cnipr.com, 2017) In this chapter, we will analyze the innovations that Mobike has made in both social and technological aspects.

6.2.1 Social innovation

One of the important aspects regarding innovation is social innovation. According to the definition by Mulgan et al, social innovation involves “innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organisations whose primary purposes are social” (Mulgan et al, 2007). In our case study, we combine social innovation with business innovation as an integrated entity, for the reason that the scale of the business becomes the dominant factor that influences both economic, cultural and political aspects of innovation since it is hard to separate business innovation with social innovation. Without reaching large scale of the business, there won’t be social innovation in this case. But on the other hand, it is a successful innovation that differentiated from pure business innovation which generally motivated by profit maximisation or social innovations which do not have financial benefits, such as non-profit social projects. Therefore, we introduce Mobike’s social innovation from both economic and cultural/political aspects.

Economic aspects

In China, especially in big cities, which have dense population, during the rush hour, there is a problem, which all the transportation methods can’t solve, the short distance transportation
problem or so-called last-mile problem. This is a niche market with large market potential. In year 2016, the users of online car-hailing reached 168 million with 37.9% growth rate (青, 2017). Mobike with its innovated stationless bike sharing service enter the market and solves the problem perfectly. The key factors that make Mobike grow rapidly and successfully within a year are innovative business model, product and operation process.

First of all, Mobike verifies some of the hypotheses, which are considered as invalid in the past or at least the pioneers tried to prove but failed. For example, whether or not people are willing to use public bikes, whether or not people are willing to use mobile application (hereinafter, App) to rent a bike and pay for it. So, no matter what the bikes look like, the core assumption of Mobike is whether or not the users are willing to rent a shared bike though App and park it in the places where other people can find it and rent it again. In order to verify this core hypothesis, Mobike designs the credit system in App and its own bike. And the core assumption makes Mobike different from others at the beginning. What’s more, Mobike uses new solutions to solve the problems that most people concerned about, and creates new usage scenario. For instance, the security issue, people will ride the bikes when there has no security issues of parking their bikes. Hence, the public, anti-theft, low return value or high cost of recycling bikes seems can solve the security problem. And therefore Mobike launched its self-produced bikes using special designs and materials with smart lock and highly recognizable colors. Another problem is that most people are not protecting the public infrastructure. In order to avoid the possible high derating rate, the bikes that Mobike produced also focus on the product stability. To avoid the bikes over dispersed in area caused by amount shortage, Mobike also sets up special bike return area. Users have to pay higher cost if they park the bike outside the return area. This regulation lead to high frequency usage rate within dense region. In addition, Mobike figure out the solution for renting and returning bike issue, such as unlocking bikes in usage of APP scanning function, use GPS navigation to find the nearby available bikes. Through creating new customer relation scenario, the interaction between customers and bikes increase, which makes the “product-customer” relation getting closer compared to traditional bike sharing.

Corresponding to the innovative business model, Mobike launched its special product that set the record of many “first”, such as first launched stationless bike sharing service in China, the first company to do independent research and develop smart shared bike, first one to launch smart bike for bike sharing service, first one offer bike sharing service based on IoT big data, first bike sharing service that build credit system etc (Sohu.com, 2017). The product Mobike offered is not concentrate on user experience but the usage scenario, which grows up image in user's mind more easier and faster than user experience.

Besides, Mobike use innovative solution to optimize its operation process. In order to manage and monitor shared bikes more efficiently, Mobike cooperates with Baidu Cloud to build smart Mobike Preferred Location (sMPL). This cooperation enhances Mobike’s
capacity of bike management and control by using precise orientation algorithm to navigate and find the bike parking places and its status rapidly and precisely (Mobike.com, 2017). With the help of technology, the shared bikes are convenient for users to pick and place. Mobike is also the pioneer to use smart preferred location to guide users parking bike correctly and using green transportation tools. What’s more, Mobike also launched “bonus bike” to assist its delicacy management. The “red envelope” bikes have special red envelope icon, customers can find and unlock the “bonus bike” through Mobike APP. These bikes have special bonus for customers: users can use them for free within the first 2 hours, and users riding those bike over 10 minutes, they will obtain up to 100 RMB bonus (Mobike.com, 2017). The “bonus bike” use the popular game “Pokemon Go” as reference to enhance reality game design, and combine with IoT and LBS technology. This gamification design makes riding “red envelope” bikes an interesting and cool “treasure hunt” game, which attracts more customers, and motivates more users active in Mobike ecosystem. Meanwhile, Mobike stimulates more users to participate its optimizing operation programme that increases the bike usage rate, reduces the bike configuration and management costs and enhances the whole operation efficiency. For instance, the “tidal phenomenon” during the rush hour leads the regional imbalance of bike supply and demand, most of the bikes might gather in CBD area. In order to balance the supply and demand in different area and time, Mobike uses the game and bonus to stimulate users take the “red envelope” bikes, so that the users are invisibly help Mobike to reallocate the shared bikes.

**Cultural & Political aspects**

As a bike sharing service provider, Mobike not only promotes its bike sharing product and concept but also encourage citizens use more green transportation methods in order to reduce traffic congestions and improve the quality of the city life. Mobike educates users more comply with the traffic rules and riding courteously. In addition, Mobike works closely with government to set up its own bike lane. In April 2017, cooperate with Wuhan transportation Bureau, the first shared bike bicycle lane and bike routes are set up in Wuhan city (Sohu.com, 2017). Mobikers can ride the conspicuous orange bikes along the setting routes legally and smoothly. What’s more, cooperating with global health dining restaurant chain Wagas, Mobike launched its “Mobike health restaurant” in Beijing and Shanghai, to promote healthy lifestyle.

**6.2.2 Technological innovation**

As Frank Geels explained from industrial dynamics perspective, innovations and novelties are often developed in niches (Blomkvist & Johansson, 2016). When the founder of Mobike - Weiwei Hu, initiated the design process of the first generation of Mobike, a lot of innovative ideas had been developed and tested in the niche products. And we have learned that “niches are often subsidised to support non-profitable innovations with the expectation of future societal benefits” (Schot & Geels, 2008), this is what the founder of Mobike had exactly prepared for. The first ideas of Weiwei Hu who started up Mobike is not purely aiming to
make profit, but rather than making more approaches to benefit the society even if she knows that the niche projects could possibly become failure products.

After investigating the problems of existing bike sharing companies in the worldwide, Mobike decided to develop a bike that require nearly zero maintenance within four years of operating time through improving the quality of tires and chains, choosing better materials to avoid the rust of the bike frames, and most important, bringing in the freedom of riding a bike whenever and wherever you want through providing reliable and abundant bike resources to the city. Thanks to the heavy investment that Weiwei Hu had secured, Mobike got its first generation of Mobike developed and tested, and followed by mass production through a new established manufacturing plant. Meanwhile, the most innovative part of Mobike is that they successfully developed a bike that can be easily accessed to, by integrate the IoT and GPS technologies. Furthermore, benefiting from the well developed mobile online payment system in China (Alipay and Wechat payment service), Mobike is able to offer its clients with station-less bike sharing service after a very easy four-step registration process which would only take about one or two minutes - download Mobike App, type in mobile number and personal ID and pay 299 RMB (equals to $43USD) fully refundable deposit through the third mobile payment service platform as mentioned above. After the registration is verified, the user only need to search for available bikes through Mobike App (each bike is equipped with GPS modular which is powered by pedalling), scan the QR code to unlock the bike and start the riding. It is even more convenient to return the bike with just two simple steps - park the bike in appropriate areas, and switch on the lock. The most surprising part is, it only cost 1 RMB (equals to $0.14USD) per half an hour for using the bike.

Even though the first generation of Mobike is still regarded as a niche product, the company received all kinds of appraisals as feedback from all walks of life. Radical innovations which are developed in niches can make a breakthrough when the stability of socio-technical regimes are confronted with problems and tensions (Geels, 2002). The reason that Mobike can be suddenly spotlighted by all the medias could be argued that they successfully eased the “pain” of lacking short distance transport solutions in the cities, just like the problems and tension described by Geels. And this “pain” was bothering a large group of citizens and now it is gone. It is reasonable to conclude that the niche product was successfully developed by Mobike but of course further technical improvements are expected at the same time since there are still expectations from the users.

At the beginning of May 2017, the newest generation of Mobike was launched in 50 different Chinese cities. This new iteration is so far the best version among all the Mobike models. New features include a solar panel fixed in the front basket which supplies electricity to the lock device, replacing the kinetic power generation system in the previous generations. The first generation of Mobike was criticized a lot for its heavy riding when the bike is low in power so that “part of the effort of riding” - the kinetic energy is turned into electricity instead. To further reduce the weight of the bike, Mobike changed their shaft gearing system
back to the traditional chain gearing system. As a result, the newest model of Mobike reduced a lot in self weight and further improved user’s riding experience.

![Figure 7 - The newest generation of Mobike (Mobike.com, 2017)](image)

Apart from the technical innovations mentioned above, the fashionable design with bright orange colors, fast connection with internet through the lock device, embedded accurate GPS navigation, 15mins reservation function through Mobike App, long life-cycle material choices, well-designed sided wheels which allows for efficient maintenance, improved non-inflatable tires and so on, all of these innovative ideas enabled Mobike to become the most favorable bike sharing company in China.

### 6.3 Porter’s five forces analysis

To understand the potential growth and attractiveness in the China’s bike sharing industry demands the use of Porter’s five forces analysis. Mobike is a growing to be one of the most commanding company within the bike sharing industry in Chinese major cities. Within just one year’s intensive business developing, the company has gained quite good product visibility and popularity. This has ensured its rapid expansion and provision of better bike-sharing services. However, it faces stiff competition from other equally cheap and effective companies like Ofo and Xiaoming bike.

#### 6.3.1 Threat of potential market entrants

As long as the business model of Mobike could be easily copied, and the Chinese government hasn’t set any regulations towards bike-sharing industry, the entry barrier is extremely low. There are at least more than 40 different all kinds of bike-sharing companies existing today in China, and yet this battle field is still expanding rapidly. To keep a leading position in this bike sharing market would require not only successful socio-technological innovations, but
also good marketing strategies. As we learnt that Mobike currently is applying for dozens of patents to protect their technical innovations, it could be a strong force in the near future for Mobike to perform as a technical leader in this industry. But on the other hand, there is no limit for upcoming rivals to jump over the initial iterations, using more mature or more advanced technologies to compete with Mobike. Therefore, the threat of potential market entrants are deemed high in this period.

6.3.2 Supplier bargaining power
Mobike owns all their bikes and being its own manufacturer at the moment, different from other sharing economy players as Uber or Airbnb. This ensures Mobike has absolute bargaining power towards suppliers. Mobike leads its own bike designs with its own engineer teams, established its own supply chain, act as an independent player in the extreme competitive bike sharing industry in China. And being so would benefit Mobike in the long term from succumbing to any external threats from other competitors, and keeping focus on the core innovative technical development as its most competitive quality.

6.3.3 Buyer bargaining power
Since there are so many different station-less bike sharing service providers in the market, customers have been given all the rights to choose whichever bike they want to ride. It is quite hard to maintain customer loyalty in this phase if there are several companies providing similar services. The switching cost for the customers are almost zero since all the deposits are refundable. In light of these factors, any of the bike sharing companies including Mobike has limited bargaining power over their clients. In order to maintain customer loyalty, Mobike needs to satisfy its users continuously through all kinds of strategies, try to solidify the buyer bargaining power as a strong force.

6.3.4 The threat of substitutes
Mobike’s station-less bike sharing service offers a new solution to short distance transportation which performs itself as a substitute to taxi, Uber or other public transportation choices. A substitute is a common force in competitive businesses. Since Mobike is aiming to promote green transportation which is “powered by human force” which distinguished Mobike from other potential substitutes that powered by energy like fossil fuel or natural resources. But the development of interruptive technologies of new transportation methods will never be limited in any time, especially with the rapid improvements happening now in green energy and automobile industries. We assume that the time becomes one of the advanced factors for station-less bike sharing industry comparing to other potential substitutes. As compared to other Porter’s forces, the threats of substitutes are considered as moderate.
6.3.5 Rivalry among other competitors

While the station-less bike become one of the most reliable and abundant resources to use for the public transportation, the competition within this industry becomes extremely intensive due to the low entry barriers. Ofo is one of the major competitor of Mobike today, and it is actually the first company in China that initiated station-less bike concept which offering a much simple bike model with less technology involved placed in university campus areas only at the beginning. Not only are the two companies competing for market share but also the investors which can bring them with better social and technological resources. A modern business environment demands corporations to target a customer base within a given geographical locations to cut on the operation cost. (Porter M.E., 1998) This is the case for Mobike and Ofo, both competing for the same customer groups and geographical locations. Mobike has a well-established business network and large capital investment, benefiting from their fast business development in the urban areas and rapid iterations in socio-technological innovations. But on the other hand, Ofo has its own strategies and advantages in many aspects as well. According to our research and field studies, Ofo offers better riding experience to the users who preferred more comfortableness during riding process. Therefore it is hard for the customers to choose which bike to ride when both choices are available and equally cheap. Under this circumstance, both companies are leaders in this bike sharing industry, but with different marketing focuses in the beginning development phase. However, there is a need for advancement of their innovation strategies to gain more competitive advantage. For Mobike it is nature that they should improve their bikes with better riding comfortableness to be more competitive, while Ofo should start to invest in the technical development of their bike systems to improve user experiences in many details, for instance, adding up the GPS navigation and better IoT connections. Besides, there are more than 40 different bike sharing companies to compete in this industry in China. In essence, it is a strong rivalry competing force for Mobike, or any other bike sharing companies in China which share similar business models with Mobike. The insignificant differentiation strategies would require Mobike to further secure and protect their technological innovations in terms of patent applications.

6.4 SWOT analysis

Strengths:

- Financial Strength: Until now, Mobike has entered D Series and acquired several investments from powerful companies such as Tencent, Foxconn, and Panda Capital etc.
- Product: Mobike has fashionable appearance and famous for its orange color; With GPS navigation, bikes are easy to find; Users can reserve bikes; with advanced smart technology, bikes are easy to control and track; offer different types of bike. Mobike
use its self-produced bike, its special design can enhance product durability and reduce the maintenance cost.

- Support from government and gain subsidy: because Mobike fits the concept of green transportation, health lifestyle, energy conservation and environment protection
- Mobike has already operated in 50 major cities, and expand its market to Singapore as well.

**Weaknesses:**
- Product: Many customers complain about the bikes that are too heavy and therefore difficult to ride; hard to find the bike during rush hour; high deposit compare to other bike sharing program
- Higher production cost because Mobike produce its own bike. Company has to invest amount of money in production plant and product development at the beginning, which reduce company’s cash flow and increase risks; uncompleted revenue stream

**Opportunities:**
- Solve the short distance, first mile/last mile transportation problems; popular in large cities especially in population-dense area; large customer base in urban area; bike can be used as moving advertisement banners, and rented to merchants; partner with sports brands or companies to promote healthy lifestyle; offer big data; partner with telecom companies such as Huawei and use their 5G technology to improve navigation and tracking function

**Threats:**
- Theft, vandalism, damage, violence from government because of illegal parking, lack of bike parking lot, not enough bike lane, people reckless driving phenomena increase the risk of bike riding; illegal car parking occupy bicycle lane; special geography makes it difficult to ride bikes; extreme weather such as extreme cold weather in Northern China during winter makes it impossible to ride bikes; fiercely competition pressure from peer competitors such as Ofo, Xiaoming bike, as well as the indirect competitors Didi Chuxing

### 6.5 Marketing mix (4Ps) analysis

The Marketing mix is one of the most useful tool to analyze a company’s strategies from marketing perspectives. The Marketing mix identifies a company’s major marketing plan using the classic 4P components: Product, Place, Price and Promotion. We assume that this tool would help us to better understand Mobike’s marketing strategies - how Mobike develop its brand image and gain popularity among the stiff marketing competitions. Of course it is natural for Mobike to change its Marketing mix strategies over time by evolving various aspects to maintain competitiveness.
6.5.1 Product (or Service) strategies

The business in the traditional bike industry is realized by customers purchasing the bicycle itself. When consumer buys a bicycle, the bicycle ownership and usage rights are 100% transferred to the consumers, therefore it is equivalent to a one-time buyout commercial activity. The new bike sharing business is achieved through leasing the usage of the bike in a period of time to customers to make a profit, while the bike sharing company still owns the bike itself. Consumers only pay for the bicycle rental services provided by the bike sharing companies. The ownership and usage of bicycles are separate in this case. Mobike, as well as all the other bike sharing companies, leases its bikes for the customers to use during a certain time period and provides bike sharing related rental services, such as the Mobike App, customer service, maintenance and so on. The key features of Mobike include superior industrial designs, embedded self-developed IoT devices providing GPS navigation for users to locate the bike and IoT technologies to unlock and lock the bike, lightweight frames, advanced brake systems, power generating systems and so on. Mobike’s product strategy is to continuously innovate its bikes based on customers’ feedbacks from previous Mobike models available on the market. The rapid iteration process with continuously improved user experiences have enhanced Mobike’s market shares and proved to be effective in promoting Mobike to be a market leader.

6.5.2 Place strategies

It is quite reasonable for Mobike to place their bikes in the most population-dense urban areas among the major cities in China. Currently Mobike only operates in Asia but with a strong expanding force. But since the competition in the urban areas becoming more and more intensive and it requires better infrastructure to support the expanding, this would affect the adoption rate of Mobike in some degree, considering some cities in China lack of designated bike paths which would create high risks for bicycle riding. On the other hand, the ruleless competition between the bike sharing companies do have created some other urban problems while they initially tried to solve urban transportation problems. The legitimacy of placing a company’s private property in public urban areas is still under discussion, although these types of properties is aiming to provider the public with convenient short distance commuting solutions. Therefore, the Place strategies of Mobike perhaps needed to evolve with more considerations from the urban planning perspectives as a whole picture, and assist the local government or municipality to draft so called win-win policies. This could be a big challenge for one bike sharing company to complete.

6.5.3 Price strategies

According to our investigations, the mainstream bike sharing service companies offer minimum leasing period of half an hour. To describe Mobike’s Price strategies, we choose three most accessible bikes from different companies in Shanghai to make a price comparison.
with each other - which are Mobike in orange color, Ofo bikes in yellow color and Xiaoming bikes in blue color.

First, all three bikes require a deposit varies from 299 RMB (43 USD) for Mobike, 199 RMB (29 USD) for Xiaoming Bike, and 99 RMB (14 USD) for Ofo. The difference in deposits is mostly because each company offer different quality of bikes. For instance, the manufacturing prices between Mobike and Ofo bikes are very much different, it could be almost 10 times in differences. However, all the deposits are totally refundable and the refunding process is quite smoothly due to the advanced Chinese mobile online payment systems.

Second, different companies charge a slightly differentiated rental fees - ranging from 0.1 RMB to 1 RMB per half an hour. According to our investigation in Shanghai, Xiaoming Bike charge 30 minutes for only 0.5rmb, plus you can get a 0.1 RMB discount for every friend you invite - which means the cheapest possible ride is 0.1 RMB for 30 minutes. Ofo is roughly the same price (but no discount) at 1 RMB per hour, but offers a discounted rate of 0.5 RMB per hour for students. Mobike is the most expensive at 1 RMB for 30 minutes for the regular Mobike. Mobike Lite is a bit cheaper at 0.5 RMB for 30 minutes.

The Price strategies here are not the dominating factors among all the four Marketing mix strategies for the reason that most companies offer free rides as a promotion campaign to their clients quite often (especially in the startup phase to attract new adopters), plus the hourly price for renting the bike is regarded almost nothing compared to other substitute transportation choices.

6.5.4 Promotion strategies

Mobike promotes its products through various city campaigns and self-generated media focuses spreading mainly through Chinese dominant multi-functional media platform - WeChat. And of course the visibility of the bikes in real life (availability of bikes) is the most important promotion strategy. It creates natural curiosity of human kinds that want to try something new and popular. The attractive fashionable appearance of a silver-orange colored bike with brand new designs further reinforced this notion.

One of Mobike’s successful promotion strategies is called “Red envelope” campaign - a reward system of relocating non-frequent used bikes by paying a small sum of money to the users who accomplished the specific task. The task requirement is pretty simple: rent a bike visualized as red envelope shape on Mobike App and ride it for more than 10 minutes within two hours rental period. As a reward, the user can ride the bike for free and will be given the chance to lottery a random sum of money and deposit the reward money to their wallet on Mobike user account after accomplishing the task. It is also possible to cash out the money under certain conditions. According to Mobike’s media spokesperson, this type of campaigns
has at least promoted 20% efficiency of their bike usage and retained earlier adopters in their systems - in other words, keeping customers deposit in Mobike’s pocket. By doing so, Mobike also managed to cut down the management cost of relocating bikes to a better location.

Another typical promotion of Mobike is to give discount to users who prepay a certain sum of money to their own Mobike account for future use. This strategy is widely used in a lot prepayment systems in all kinds of product campaigns.

The third strategy of product promotion is to collaborate with other popular brands in other industries, such as Smartisan collaboration (Chinese popular smartphone company), to create a win-win marketing effect for both brands.

7 Conclusions and future development

The traditional business of bike still plays a significant role in most parts of the world. It not only takes up quite a lot personal space but also require personal fully responsible to keep the bike in a good condition without dominating much public social resources. Unfortunately the average usage rate of personal bikes are quite low. City bikes provided by government on the other hand complemented the public transportation in a more sustainable way. But its inconvenience of rental process affects a lot on adoption rate, not even mention the availability of such a city bike is quite limited in terms of location and numbers. Station-less bike sharing service changed the public short distance transportation methods in an revolutionary way. The advantage of the new bike sharing system is not only based on the station-less concept but also the perfect timing - the maturity of IoT technologies, GPS navigation and electronic payment convenience. It perfectly connected the need of people with the advanced but yet developing modern technologies. Without the modern technological development, it is not possible to realize the online management and operations of these station-less bikes in such an efficiency and low cost way. By application of big data techniques, it is also possible for the Mobike’s management team to make decisions such as where to place their bikes and how many bikes should be placed at a certain place to promote the efficient of a bike’s utilization, based on the data analyses. The successful transition from a four-wheel dependant society to a two-wheel prioritized society would benefit us in many ways - less traffic jams, less air pollution, less fossil fuel usage, less land scarcity in car parking space in the city, healthier lifestyle and so on. It is a new business that would help the society to approach better sustainability in many perspectives - social, environmental and economical, especially in China that currently experiencing heavy air pollutions. However, there is still a long way to resolve all the social problems that brought by this trend as we mentioned in previous chapters. Therefore, we suggest the following optimizing and expansion strategies for future development within this industry that would promote the adoption of the new bike sharing system (in the perspective of Mobike but not limited to).
Future development

- Worldwide geographical expansion with proper strategies - localized development plans with respect to local culture and native user expectations
- Further technical improvement required, continuous product iterations - better accuracy in GPS capability, better quality of user experience, feasibility design especially for night time
- Development of a more advanced AI platform - to further facilitate the efficiency in using big data collected from bike sharing system
- Collaborate with local city planning department for creating proper infrastructure for safe riding, such as setting up designated bike lanes, setting up docking area in necessary dense areas, marking up legal parking spaces, etc
- Pushing for legitimacy for station-less bike sharing industry in China
- Closely collaborate with local government, promote the management of station-less bikes to facilitate a healthy bike sharing ecosystem
- Considering partner up with major competitors for example Ofo, rather than competing in consuming public resources
- Customer education in a more holistic way - reducing illegal parking and further promoting green transportation
8. References


CIW Team (2017). *China's mobile payment transactions almost doubled in 2016.* [online]


