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## OPPORTUNITIES AND CHALLENGES FOR COMPANIES IN THE BIKE SHARING INDUSTRY ILLUSTRATED BY THE EXAMPLE OF NEXTBIKE POLAND

One of the directions for sustainable transport development in cities is sharing the means of transport. Amongst the most dynamically developing forms of urban transportation is bike sharing, which has already been implemented in various cities across the globe. This article aims to depict opportunities as well as challenges for the bike sharing industry. Enterprises providing such services are successful, due to, among others, a growing interest of local governments in the development of bike sharing programs, which is often reflected in the financial support for this type of undertaking and the high demand for bicycle-transport in cities. However, this type of business is also exposed to the risk associated with the costs of servicing the system, highly competitive market, changes in the economic situation, and rather unfavourable contracts, to mention a few. This risk is especially high while implementing innovative solutions, as is shown by the example of the MEVO system. Also described in the article are the processes of overcoming the obstacles plaguing the bike sharing business.

**Keywords:** transport, bicycles, city transport, bike sharing

**JEL:** R 40

### Introduction

One of the most important directions of sustainable transport development is the use of bicycles as a means of everyday urban mobility. A significant problem, however, is associated with having to leave the bike unattended – concern with theft and vandalism in places of parking. The appropriate solution, in this case, is the use of shared bikes, i.e. bike sharing. In recent years, more and more cities

in Poland and Europe have been building such systems or expanding the existing ones. This trend generates the need for companies providing bike sharing services.

The tasks of such enterprises include:

- system implementation: delivery of bikes, construction of the bike-docking stations, creation of an application and a website, establishment of a system for management and supervision;
- operating the system: subscription sales, financial transactions with clients, relocation of bicycles (overnight transport of bikes from over-loaded docking stations to the under-stocked ones), bicycle and station servicing, delivery of new bikes to replace vandalized, broken-down, or stolen ones, marketing campaigns to encourage bicycle usage.

Along with the benefits of subscription sales and funding from local governments, system operators have to take into account the many responsibilities and some pitfalls associated with this type of bicycle rental. This article aims to show the opportunities and challenges for companies involved in bike sharing, with particular emphasis on Nextbike Poland.

## 1. Methodology and theory

The article was prepared on the basis of available research materials and, among others, a PhD thesis, as well as the applicable statistical data related to the Metropolitan Bike System (System Roweru Metropolitalnego). Very helpful was also our own experience gained from the collaboration with the largest bike sharing and system implementation operator in Poland in the Gdańsk-Gdynia-Sopot Metropolitan area. This article may be used for future research to indicate the direction of changes in the bike sharing companies' activities.

## 2. Results

The conducted research and analysis have shown that the opportunity for the companies in the bike sharing industry is rooted in high demand for this type of services, the growth of which is stimulated by:

- increasing interest of local governments in bike sharing as a way to reduce congestion and smog in cities,
- dynamic development of various forms of transport sharing (cars, mopeds, bicycles) allowing for a gradual education of the society in the use of this form of transport,
- cycling as a trend, both for transport and tourist purposes,
- while the main threats to such companies pose:
- bad bike quality, contributing to many failures,
- acts of vandalism and theft,
- incorrectly estimated offers in the bidding,
- changes in the way bikes are financed by local governments
- growing competition on the market.

### 3. The essence and development of bike sharing

Sharing bikes is a fairly new form of transport. Although it was first introduced in Amsterdam in 1968, the rapid development of bike sharing didn't appear until the beginning of the 21<sup>st</sup> century. The definition of bike sharing, or renting of bicycles to users who need it, mainly includes three elements:

- usage instead of ownership,
- for a specific purpose and
- at a specific time (Fernandez, 2011).

However, the biggest challenge here is to determine the difference between a typical bike rental and a sharing company. Table 1 presents the basic differences.

Table 1. Differences between traditional bike rental and bike sharing services

Factor	Traditional rental	Sharing
Type of travel	both directions	one direction
Payment for one-direction travel	exist	don't exist
Contribution of the human factor	during rental, servicing, and relocation	during servicing and relocation
Subsequent rentals	employee has to check the bike's condition before renting it out again	possible as soon as the previous user returned the bike
Number of rental stations	limited	provides many possibilities

Source: own elaboration based on: Fernandez A.C. (2011).

The beginnings of the bike sharing concept and its first implementation date back to 1965. That year, in Amsterdam, local social activists lobbied the city to buy 20,000 bicycles and distribute them in various parts of the city so that residents can use them. The city government did not consent. When the activists independently set up white-painted bicycles on city streets, the bikes were quickly removed under a law which saw this action as encouraging the theft of public goods. These attempts were repeated in other European and American cities, albeit without success, always concluding with theft and vandalism. This type of bike share is referred to as I generation public bikes (EU-CONSULT, 2016).

The breakthrough for bike sharing came in 1995 when the second generation bicycle was launched in Copenhagen. Over 1000 bicycles and 110 bicycle-rental/return docking stations were made available to residents 24 hours a day, seven days a week, from April to November. Bikes operated on a similar principle as shopping carts. The person who wanted to use a bicycle placed a coin in a slot, and that served as a deposit. After returning and fastening the bike, the coin was returned. Aside from the deposit, users did not incur any additional charges (EU-CONSULT, 2016).

Opportunities for a profitable operation of bicycle shares emerged with the arrival of the third generation public bikes. First such system was introduced in 1998 in Rennes. Two hundred bikes and their 25 docking stations were connected with one IT network. The rental was made possible using magnetic cards issued by the operator's employees. Development of technology has led to the current

bike rental system through QR code scan in a smartphone application. After scanning the code, the bike is removed from special stands, and after use, the rental is completed by inserting and attaching the bike back to the stand. All financial transactions are handled remotely (they are transferred from a credit card added to the user's account or other sources that credited the account). In the last few years, the IV generation bikes have earned some special attention. The bicycles are equipped with GPS and GSM modules which permit users to return the bike anywhere in the city, not necessarily to the docking stations. Theft is avoided thanks to the GPS module, which allows for accurate tracking.

In recent years, especially in Asian markets, the bike sharing industry saw a large number of newly established start-ups coming onboard. Subsidized by large corporations, the companies offered IV generation bikes at a price of €1 for 30 minutes of use. It was a competitive offer, because the cities did not have to help financially for the operation of the rental, and even charged a special fee for it. Unfortunately, this scheme turned out to be unprofitable and ended with several companies collapsing (Zhao, 2018).

#### 4. Benefits for bike sharing companies

The use of bike share is connected to three modes of financing:

- the local government covers 100% of the operating costs, and the system is free for residents (e.g., Warsaw, free travel up to 20 minutes);
- the system is co-financed by the city – residents pay a symbolic fees and the rest is covered by the city (e.g., the Gdańsk – Gdynia – Sopot Metropolitan Area with the MEVO system where the monthly subscription for 90 minutes of daily driving costs PLN 10);
- the system is fully paid for by the user – the local government receives a fee from the operator in exchange for permission to display bicycles in the city (e.g., in cities of Western Europe).

The bicycle is one of the elements of sustainable transport development. This is a particularly important aspect related to the development of cities. The use of public bikes has the advantages of strengthening the public transport offer for residents, protecting the environment, improving the economic situation of residents using bicycles instead of cars, improving health (City of Wilmington, 2016). All of these elements give cities and municipalities permission to finance such projects from the local budgets.

In Poland, the most common financing scheme in the **bike sharing** industry is **100% financing by local governments**. For example, Warsaw paid PLN 4.4 million for each season (from March to November) until 2016 (Nowak, 2017). In this amount, the users of the Warsaw city bike system (Veturillo) can ride the bike for 20 minutes without any fees. After exceeding that time, a fee of PLN 1 is charged for the first hour and PLN 3.00 for the next hour. As a result, to avoid paying fees for longer distances, the users started to drive in the "station to station" pattern, changing the bicycle in less than 20 minutes (Głogowski, 2017). Unfortunately, this solution results in creating artificial statistics. It is difficult to determine how many journeys

have actually been travelled. There is information on the number of trips, but in this case, it is not equal to the number of journeys. A similar situation is taking place in Wrocław. For servicing the system from March 2019 to the end of 2022, the city will pay over PLN 20.5 million (Nextbike, 2018). It is worth adding, however, that in both cities all income for exceeding the free time goes to the municipality. In the case of Warsaw, this income covers about 30% of the operating costs of the system (Nowak, 2017).

This is the best type of financing for companies providing the city bike rentals. Regardless of how many people use the bike and how many bikes are rented, the operator receives a fixed flat fee. Obviously, the best situation from the point of view of the company is rainy weather, when residents do not use bicycles, while the company is still collecting the fees.

The second way of financing – **partial co-financing by the local government** occurs when residents pay a symbolic fee for using the bicycle from the first minute, while the rest of the system's operating costs are covered by the local government. This financing method was adopted in the MEVO Metropolitan Bike System in the Gdańsk-Gdynia-Sopot Metropolitan Area. In this case, the funding had two phases and included:

- purchase of the system i.e., bicycles, website, docking stations, smartphone application, a system for monitoring all the aspects of the contract – all for an amount of approx. PLN 35 million (in other cities, the operator rents out the bicycles and the system),
- system operation, i.e., service, relocations – for an amount of approx. PLN 60,000 per month (OMGGS, 2018).

At the end of the contract, the entire system will remain the property of the Metropolitan Area, and the operator, therefore, has no rights to the system. The company receives about PLN 720,000 annually. Its task with this financing method is to provide the highest quality services so that the residents are willing to subscribe for PLN 10 a month, in which case they can use the bicycle for 90 minutes per day, or to use the minute tariff, paying PLN 0.1 for one minute (OMGGS, 2019).

The third mode of system operation, **user financing**, has been mainly adopted by the Chinese public bike systems, e.g., managed by OFO or Mobike. Companies financed by powerful corporations can offer low prices for their bike usage, without government involvement. In the case of such systems, the fees amounted to approx. 1 for one trip. In Poland, these companies also planned to expand but were not allowed to do so by local governments. Talks with representatives from these companies suggested that the fee would be about PLN 1 for 30 minutes of use. These companies offered a monthly fee to the city for the opportunity to use the bicycles. It should be mentioned that the companies offered their services only in the centre of large cities, not the outskirts. Therefore, the transport value of such a system would be minimal.

In addition to payments from cities or bike users, bike sharing companies use **other methods of financing**, e.g. they may receive additional revenues from the sale of advertising space on bicycles or so-called sponsor stations (bicycle docking stations, covered with sponsors' logos).

Financial results of companies in this industry, however, say a lot about their primary sources of income. Fig. 1 presents the revenue structure of Nextbike in 2017. Over 70% of the revenue was generated from municipalities and cities. Income from bikers accounts for only 2% of total revenue.

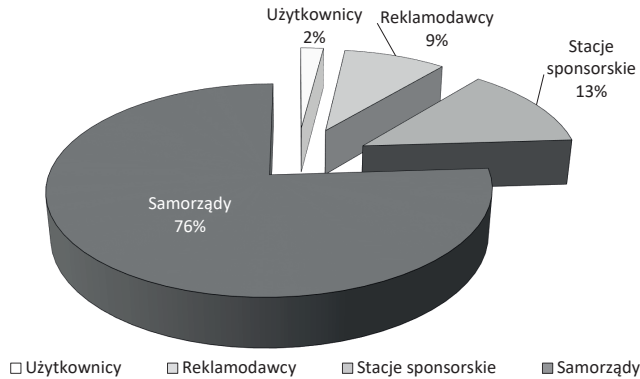


Figure 1. The structure of Nextbike's revenues in 2017  
Source: own elaboration of the base: (Frączyk, 2018)

## 5. Challenges for the bike share companies

The biggest threat to companies in the bike sharing industry is the loss of financial liquidity. That can be associated with various hazards, and one of the main ones is vandalism. This is mainly because there is no supervision over the bicycles standing in the docking station. Another significant risk is the theft of bicycles, which is directly related to the loss of financial liquidity. As soon as the system has a lot of damaged bicycles, it becomes less attractive to the users. In a system subsidized by local governments, operators must take into account contractual penalties and in the case when the residents buy subscriptions – loss of customers. Financial problems may also be caused by the underestimation of the tender offer or by high competition forcing the lowering of prices.

Large scale theft of bicycles is reportedly the primary reason for company insolvency due to the lack of financial liquidity (Zhao, 2018). An exceptionally high number of **theft and vandalism of bicycles** may contribute to a sudden, unforeseen increase in operating costs. In the case of contracts with cities, companies are additionally required to maintain an adequate level of bicycle availability. As a result of vandalism and theft, it may turn out that availability is falling, and the company is charged with additional contractual penalty fees.

Companies that submit their offer in the original tender price their services for several years ahead. Minor errors resulting from **incorrect estimation**, together with changes in the economic situation, in the case of systems co-financed – as opposed to fully financed- by cities, can cause significant problems especially when paired with difficulties in acquiring customers for advertising and sponsorship stations.

The competition of companies co-sponsored by large Asian corporations is a big threat for companies financed by local governments. Attractive financial offers from Chinese companies may cause local municipalities to stop holding bidding auctions for bike shares and agree for private companies, which charge users a small fee, to take over public bike rentals. In Warsaw, the Acro Bike system has been operating for two years. Using a bicycle for 30 minutes costs PLN 1, and the user has to pay a deposit for renting the bike in the amount of PLN 99. The company's operation is similar to the Asian business model. The experience from the eastern markets shows, however, that such companies have little chance of survival. In 2017, seven such businesses went bankrupt. The high deposit is also problematic in this scheme. As a result of the bankruptcies, the users lost over \$150 ml in deposits (Zhao, 2018).

The public bike share market is currently rather unstable. Fierce competition leads to risky decisions, which result in financial trouble. One of the examples is the Chinese company OFO. Known for its yellow bikes, the company planned to expand to the European market, including Poland (Ratajczak, 2017). Currently, OFO is on the verge of bankruptcy. The main reason given for the failure is "inability to correctly assess the changing external environment since the end of last year." The company spent \$25 million a month on its development, while OFO's competitor Mobike, \$50 million. Currently, the Chinese owner of Mobike is planning to sell its European branch (Mobike bikes can be found, among others, in Berlin) (Yang, 2018). This situation shows that the bike share market is volatile, and satisfying performance of companies in previous years does not necessarily guarantee their success in the long run.

## **6. MEVO – threat for Nextbike Poland**

The Metropolitan Bicycle System (polish: System Roweru Metropolitalnego) MEVO began its services on 26 March 2019. According to the forecasts, MEVO is supposed to be the biggest and the most innovative IV generation public bike share system in Europe. Its goal is 4080 bicycles of IV generation technology, which can be left in anywhere after use, equipped with electric motors. The launch of the first stage (30% of bicycles – 1224 units) was planned for 18 November 2018, and from 1 March 2019 the system was supposed to operate in its entirety, i.e., all 4080 bicycles were to be available.

The over three-month-long delay in the launch of the first stage of the MEVO system resulted in a PLN 900,000 contractual penalty. According to the contract, for every month of delay of the second stage, the company will have to pay PL 300,000. As of 1 May 2019, MEVO did not activate the second stage, which means the third month of delay has started, and the company owes another PL 900,000 in penalties. Therefore, together, the fees for the postponement of the system amount to PLN 1,8 ml, which amounts to 5% of the worth of that part of the contract (OMGGS, 2018).

According to the contract, the company receives PLN 60,639 per month for operational costs. The company's revenues also include profits from subscriptions, advertising, and sponsorship stations. However, MEVO can also be charged with penalties for the improper functioning of the system.



From the very beginning, the company has been experiencing system malfunctions. According to the contract, the company should ensure the **availability of the system** in 98% at the minimum. This means that when using a fleet of 1224 bicycles, only 24 can be out of order. For the availability at the level of 98-95%, the company pays a fine of PLN 3000 per day, with the availability of 95-90% – PLN 5,000 per day, and with the availability of 90-50% – PLN 10,000 per day.

Additional penalties include improper **relocation** services (30% or more bikes missing at the docking station, or the station is over-loaded by more than 200%) in the amount of PLN 100 for each station per day, and for **bicycle repairs** lasting longer than 12 hours, a fine of PLN 50 is added for each hour that's started. If there is a penalty for the availability of less than 50%, (PLN 100,000 per day), the penalties for non-relocation or long service are not charged (OMGGS, 2018).

During the first 30 days of the MEVO system operation, only for 13 days the availability of bicycles reached a level higher than 50%, which is shown in Figure 2. The problem with the availability of bicycles is due to issues with charging (service technicians exchange the batteries in bikes manually) as well as numerous defects and acts of vandalism.

In the event that the battery level drops below 20%, the bike appears in the system as a "bike with a defect". Company employees are expected to replace the battery within 12 hours. Initial problems for the company, caused by too few chargers and spare batteries, resulted in bikes being discharged for over a dozen hours at a time (OMGGS, 2019). Vandalism has also turned out to be a big problem. Unknown perpetrators destroy bikes by cutting their tires and saddles. Several units were also thrown into bodies of water, which resulted in complete devastation of the electrically propelled bicycles. Additionally, improper use of bikes can cause damage to the wheels (entering the curb at high speed or with the person on the trunk – although it is prohibited).

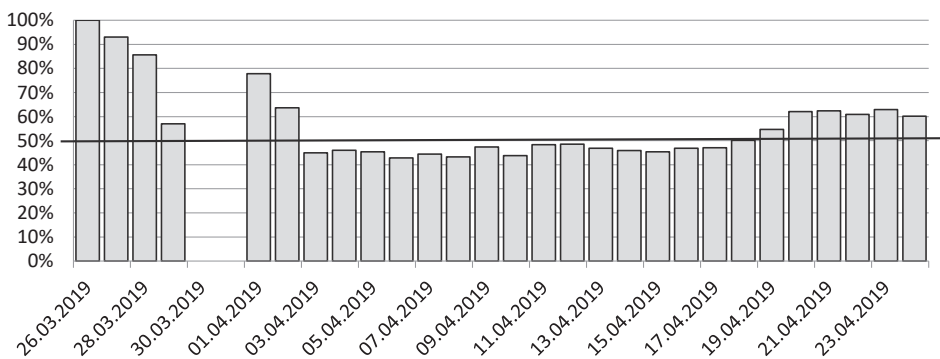


Figure 2. Availability of MEVO bikes within 30 days of system operation in 2019  
Source: own elaboration

According to the contract, the maximum penalty that the company can receive for a less than 50% bicycle-availability in the first month is PLN 1.7 million. Additionally, there is a penalty for 11 days of availability at a 50-90% level (maximum



PLN 110,000) and one day of 90-95% availability (PLN 5,000). This gives a total of up to PLN 1,815 million just for less-than-perfect bicycle availability. In addition, in 13 days, other penalties could pile on related to a long bike repair time or poor relocation. It should also be noted that these are maximum penalties, which can be reduced in court proceedings if the company disagrees with them and proves partial lack of fault.

It's hard to imagine a situation in which the amount of penalties is covered by subscription sales, when revenue from the local government for operating the system can only cover about 3% of their value. It's important to mention that the operator blocked user payments for a dozen or so days and after unblocking them, announced that after reaching 20 thousand payments, they would be blocked again (Dybalski, 2019). Financing the penalties may cause fiscal problems for the company. It may be that these problems have contributed to changes in the management. Five days after the launch of MEVO, Dariusz Komorowski (responsible for the company's finances) resigned as a board member, and a dozen days later, the president, Robert Lech, was dismissed and replaced by the owner of the main shareholding entity – Paweł Orłowski (Wirtualne Media, 2019).

Nextbike Polska is listed on the Warsaw Stock Exchange. The company's problems reflect negatively on the price of its shares, which makes it an unattractive investment opportunity.

Another risk for Nextbike may be that if MEVO succeeds, local governments that finance public bicycles might switch in 100% to a co-financing system, in which the operator seeks more financing from bike users.

## **7. The chances of overcoming the challenges by Nextbike Poland**

Nextbike Polska also operates other public bicycle systems in Poland. In other cities, the company operates on the principle of 100% financing by the local government. Such a situation may allow the company to maintain financial liquidity, even if the MEVO system brings no or little profit. Particularly noteworthy is the fact that a system consisting of only bicycles of IV generation with electrical support has not yet been introduced anywhere else in Europe. The existing systems with electric bicycles are III generation (the bike must always be returned to the docking station where it's charged). It may turn out that the company develops know-how of service and operation of this innovative system that can be resold to other entities. It may also get tested on the Polish market, an original, state-of-the-art product that the company will be able to launch on the European or global market.

Improvement in system operation can help overcome the difficulties with MEVO. Every day, the system lacks approximately 400-500 bicycles that are in service. If the company ensured a several times larger service team, that would allow the circulation of all 1,224 bicycles and faster troubleshooting. The company should also create more facilities for bike servicing. Currently, their main warehouse is located at the Energa Stadium in Gdańsk. That's where bicycles from all municipalities go, including Ostrzyce (Somonino municipality, 42 km away), Stężyca (56 km) and Władysławowa (65 km). Cooperation with local bicycle service providers,

even at increased costs per unit, would increase the availability of bicycles, thus preventing substantial contractual penalties.

Changes in management are also a promising opportunity for the company. The person standing at the head of the Larq investment fund for over a dozen years has a good chance of leading the company out of difficult times.

The problems and bankruptcies of the Chinese competitors are another positive turn of events for Nextbike. Additionally, an introduction of good quality equipment can be appreciated by potential local government and business partners and result in new contracts for the company.

## Conclusions

Companies involved with public bike sharing are especially vulnerable to loss of financial liquidity. The example of the Polish company Nextbike shows that this type of company getting most of its revenues from local governments is able to do well. The first project, which was in part financed by the local government and in part by the bikers, illustrated that a company's financial viability could be severely undermined by a poorly estimated tender. Nextbike also took a major risk by introducing an untested system which combined the electric bike's need for battery replacement by a service technician with the user convenience of being able to leave the bike anywhere. The contractual penalties due to the malfunctioning of the MEVO system are a significant threat to the company. It turns out that the funds that the company receives monthly from the local government covered just 3% of the penalty. Therefore, it's especially important that the exceptional quality of the entire system encourages bikers to purchase subscriptions since it's an essential financial tool for the success of the project. However, an excellent opportunity for the company may be that a refined version of such an innovative system can be particularly valuable in terms of selling its "know-how". Ultimately, it is worth bearing in mind that many companies from the global bike sharing industry are failing; hence the company ought to ensure its financial liquidity.

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