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STRATEGIC BUSINESS MODELS: THE IMPORTANCE OF THE MAAS MODEL IN THE MICROMOBILITY INDUSTRY

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ABSTRACT

This report provides sound recommendations for improving business models within the newly emerged micromobility industry. The following research questions are addressed: What business models are being used; what are their characteristics and associated advantages and vulnerabilities? Based on the vulnerabilities, how can the business models be improved? These questions were answered by using a mix of qualitative and quantitative data. Throughout the analysis, lack of profitability was a significant vulnerability of nearly all Mobility as a Service (MaaS) providers offering a micromobility sharing system. Recommendations were made to change key elements of existing business models to mitigate the vulnerability.

KEYWORDS

Strategic Management, Business Model Analysis, Business Model Innovation, Micromobility, Urban Mobility, Urban Transportation

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NOVA SBE

STRATEGIC BUSINESS MODELS

The importance of the MAAS Model in the micromobility industry

AGENDA

1. **INTRODUCTION**
   Scope, Motivation, Methodology
2. **EVOLUTION**
   Historic Business Model Development
3. **INDUSTRY BUSINESS MODELS**
4. **BUSINESS MODEL ANALYSIS**
   Platform Model, MaaS Model, Ecosystem Model
5. **INDUSTRY OUTLOOK**
6. **RECOMMENDATIONS**
   Busines Model Innovation
7. **CONCLUSION**
   Key Insights, Limitations, Extensions

4

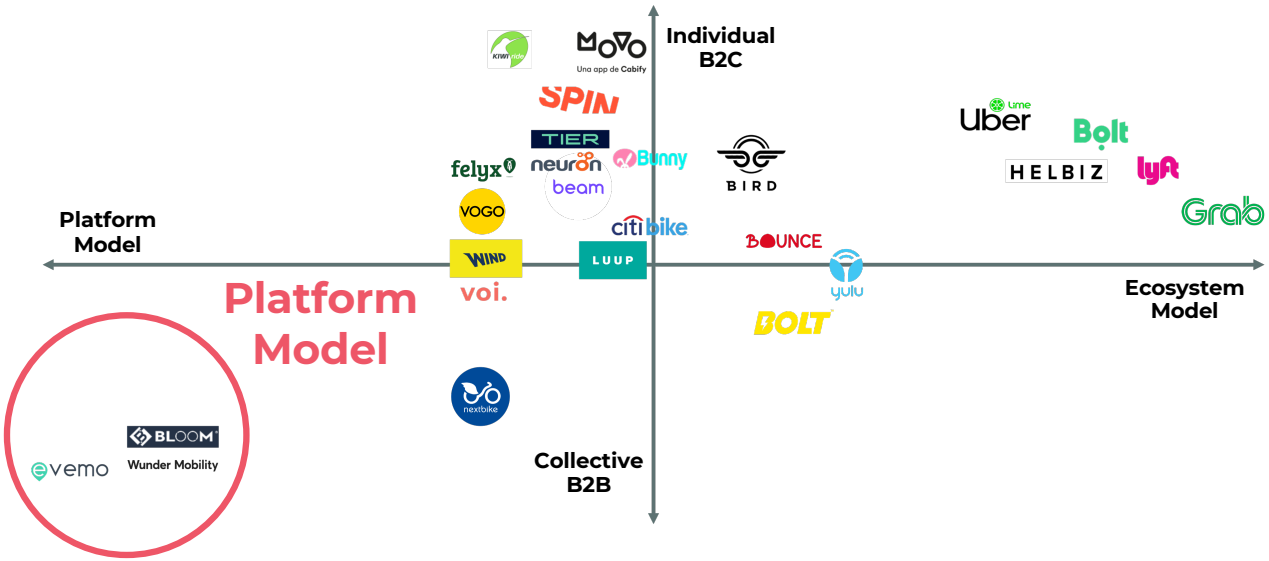
BUSINESS MODEL ANALYSIS

PLATFORM MODEL, MAAS MODEL, ECOSYSTEM MODEL

Platform Model

Platform model companies provide software solutions to enable entities a quick and easy entry into the mobility business

PLATFORM MODEL CLASSIFICATION



Comment

Platform model firms **provide a digital platform for ridesharing operators**. The platform manages rides and creates a vehicle network with which the end-user can interact. This means that B2B customers get a digital infrastructure for ridesharing. However, platform model firms **also offer ready-to-go solutions**, **including a fully functional vehicle fleet** next to the software.

Companies following a platform business model offer so-called **software as a service** (SaaS) solutions and **do not conduct ridesharing operations**. This digital solution is mainly sold to businesses and entrepreneurs.

Customer Segments

Institutions and individuals are the target customers of platform companies. However, individuals make up only a small part, while the majority are institutional customers

Sources: 1) BLOOM Sharing Technology LLC, 2021; 2) Wunder Mobility, 2021; 3) Evemo, 2021

Entrepreneurs[1)]

Individuals who want to **lead mobility into a more sustainable future**. Anyone who believes to have the required skills to run their own micromobility ridesharing business.

Institutions[2)3)]

These are **large companies or public institutions** that want to offer new green transportation options in their community. For instance, micromobility can complement public transportation.

Comment

Due to the reason that institutions usually have more resources and can carry out such investments more easily, the **majority of target customers are institutions**. Typical institutional customers are utilities, corporations, educational institutions, mobility companies or residential communities.

Individuals make up only a tiny proportion. These entrepreneurially driven persons try to fill a void in a specific target market.

The common thread among all customers is that they **want to provide an alternative way to travel** which is exclusive, reliable, and environmentally friendly.

Value Proposition

The value proposition of platform model companies can be divided into three parts: velocity, personalization and digitalization

Sources: 1) Wunder Mobility, 2021; 2) BLOOM Sharing Technology LLC, 2021; 3) Evemo, 2021

VALUE PROPOSITION

Velocity

Platform model companies offer their customers, whether budding entrepreneurs or institutions, **quick access to all the required resources to start operating** a micromobility ridesharing system. In particular, the provision of the software, but also the connection to hardware vendors, is established by them.

In addition, their broad expertise and experience **help to accelerate expansion into new markets**. In this context, they offer consulting services that ensure successful implementation.

Personalization

Based on a core software, customer specifications can be easily added. This means that any **functionality or design can be customized**[1]. For example, companies can integrate their own branding and choose from various features they want to include[2]. Platform providers can also **integrate third-party systems** for which they do not have own resources.

With this service, customers get an **individualized ridesharing software** designed after the needs of the customer's community.

Digitalization

Platform model companies **help providers to digitalize their mobility services**. For instance, mobility-sharing companies that use outdated software can benefit from such a solution, mainly because **software can be easily installed or integrated into existing systems**.

Integration into public transportation networks is one of the possible application area[3]. This would allow end-customers to use and pay for several transportation modes via **one single digital app**.

Key Partners

The key partners of platform model firms are vehicle manufacturers and public institutions. Third-party developers, investors and banks represent minor partners

Vehicle Manufacturers

For providing a sharing-ready network, vehicle manufacturers are one of the key partners. **Their vehicles are purchased to install all necessary digital components** such as connectivity or the user interface.

For providers with their own fleet, **software compatibility must be verified**, which may require coordination with the respective vehicle manufacturer.

Public Institutions

The **software must be adapted to local regulations** – for example, speed and age restrictions. These must be configured upfront in the software, which is why **close communication** with these is essential.

Public institutions such as municipalities or universities **impose regulations and act as customers**, as mentioned before.

MINOR PARTNERS

Third-party developers

Third-party developers may need to be consulted **to develop functions** on behalf of customer requirements for which the company's internal resources are insufficient.

Investors

As the industry and its companies grow substantially, **adequate financial resources are required** to serve the industry's growth rate accordingly.

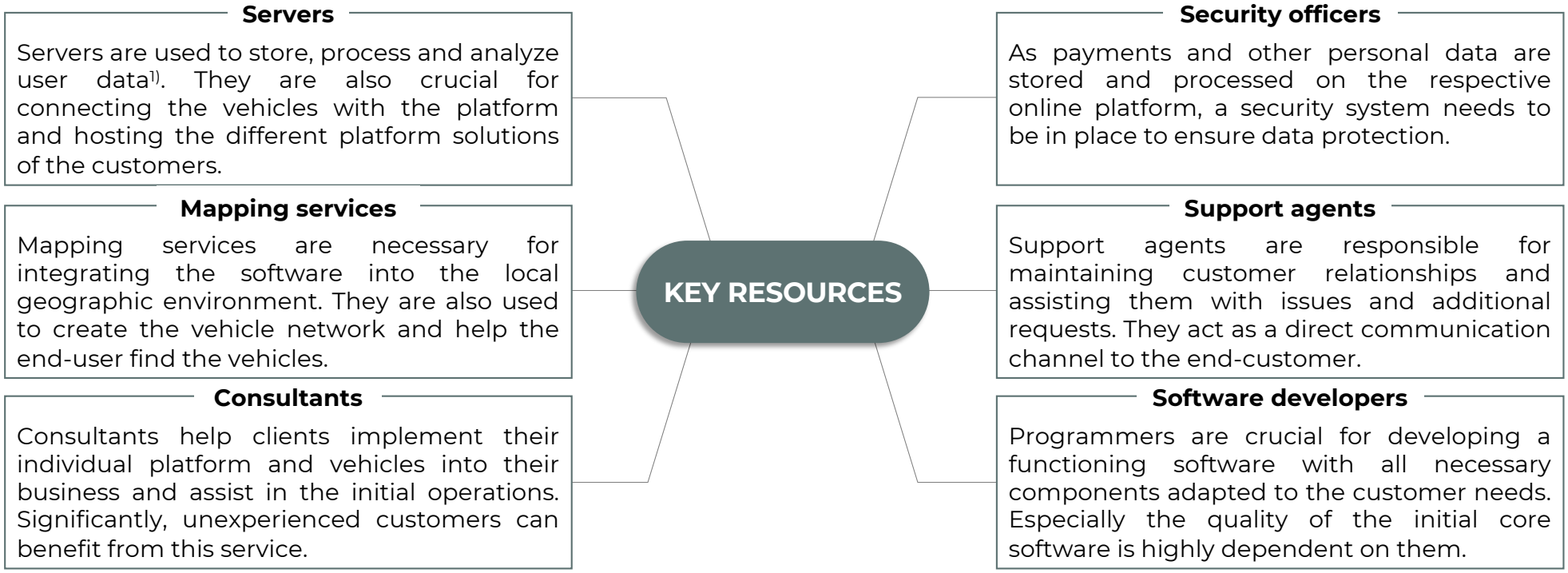
Banks

Payment systems need to be integrated into the software **to provide seamless payment options** for the end-customer. Therefore, payment processors are crucial.

Key Resources

Developing and implementing a micromobility platform successfully requires the combined effort of six resources

Sources: 1) Indeed, 2021



Key Activities

Software development, constant exchange, and maintenance are essential before, during, and after the product delivery to guarantee customer satisfaction

Software development

Software development involves hiring programmers and mobility experts to **create an all-encompassing sharing platform**. In this context, the initial development and its performance compared to other providers is crucial for its success.

A viable network must be created, integrating and connecting all necessary parties.

Maintenance

The **software and the corresponding applications must be constantly updated** and maintained. For instance, functionalities must be continuously improved, and bugs must be fixed efficiently.

In addition, **after-sales interaction** with customers is an essential component where adjustments and additions can be made.

Constant exchange

Close and continuous communication with customers and suppliers is necessary to develop a personalized mobility platform according to customer needs successfully.

As platform companies also connect their customers with vehicle manufacturers, permanent exchange with them is also crucial.

Revenues

The revenues are generated via a subscription model. The amount of revenue depends on the software specifications and the product package

Sources: 1) BLOOM Sharing Technology LLC, 2021

Revenue components[1)]

BASIC SOFTWARE
+ Geofencing Capability
+ Location-based Advertisements
+ Customer Branding/Design
+ Continuous Support
+ Analytics Portal
+ Consultation Fees
+ Third-party Integration

VEHICLES
+ Built-in IoT connectivity
+ Customer Branding/Design
+ Sharing Features (e.g., smartphone holders)

ALTERNATIVES

Software-only solution

Pricing is **based on the sophistication of the software** and the extent of features included. For example, consulting services can be purchased on top to support implementing a micromobility service in a target market.

Sharing-ready solution

A ready-to-go package **contains all necessary components to start a micromobility ridesharing business**. In addition to software and hardware components, extensive implementation support is included within this solution.

Both solutions can be further customized. The platform model firms earn via a **subscription model on a monthly basis**.

Costs

The main sources of costs are research and development and marketing costs. These costs are high, especially in the initial phase.

Sources: 1) Valchev, 2020; 2) Saljoughian, 2019

Cost components

COST OF GOODS SOLD[1)]
- Hosting and monitoring
- Customer success management
- Data communication
- Software license
- Website and app development
- Training personnel
- Costs of subscriptions

OPERATING COSTS[2)]
- Sales and marketing
- Research and development
- General and administrative

MAIN COST SOURCES

Sales & marketing[2)]

At around **40% of revenues**, sales and marketing costs **account for the largest share of costs**. These costs can be reduced through economies of scale, scope and learning and the development of strong brand awareness.

Research & development[2)]

R&D costs are high initially but drop after the first software version is developed. This is due to learning effects and the fact that only maintenance and updates are necessary once the core product is developed.

COGS account for 10-20% of revenue[1)]. The exact share of the individual variables depends on the final product's configuration.

Advantages & Vulnerabilities

The high margins and scalability are attractive. However, the threat of vertical integration and the high customer acquisition costs are a major drawback

Sources: 1) Cordrey, 2020; 2) IBM Cloud Team, 2020

ADVANTAGES

Margins

SaaS providers generally benefit from **high profit margins**. After the initial development, the main CAPEXs are spent, and only minor costs are required. The **gross margin** of software providers is **typically around 70%**[1]. In addition, companies in the platform model benefit from mediation to hardware manufacturers and consulting services, also representing services with high margins.

Scalability[2]

Companies following the platform business model develop and offer a basic software that contains all essential functions. In addition to that, these software are easily changeable and customizable depending on the customer's needs. As seen in the revenue analysis section, the range of functions that can be implemented is extensive. This **flexibility results in a highly scalable business.**

VULNERABILITIES

Customer acquisition

Customer acquisition is a major challenge for platform model companies in the micromobility industry. Once a mobility provider uses a specific software, their **willingness to switch is very low** as high switching costs lock them in. Combined with the threat of vertical integration, the **number of potential new customers is very limited**.

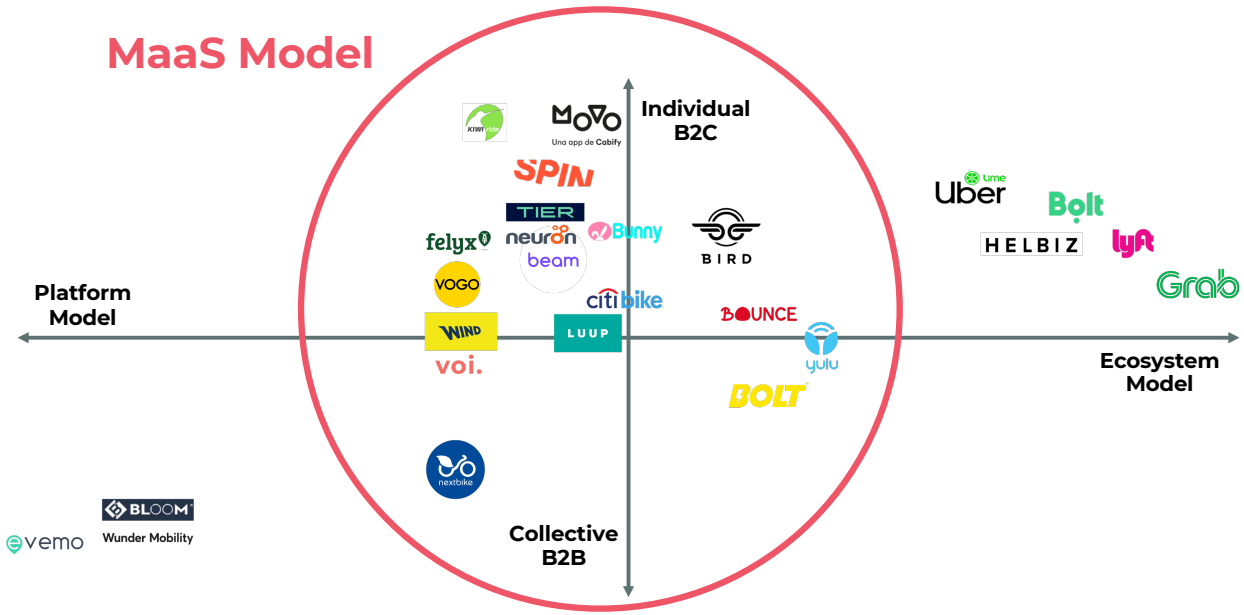
Threat of vertical integrations

Due to the industry environment with many different players in the market, **experts predict a market consolidation** in the near future. The larger players will most likely buy up smaller competitors in this process. Most of these larger firms have their **own internally developed software that will most likely replace the acquired company's software**, making their software obsolete.

MaaS Business Model

The companies that use the mobility as a service business model are distributors, offering their micro-vehicles in a sharing system

MOBILITY AS A SERVICE CLASSIFICATION



Comment

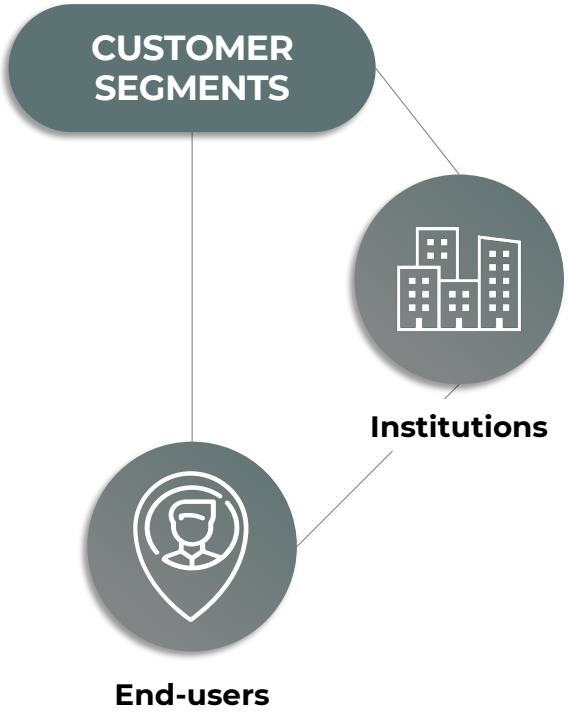
Mobility as a Service (MaaS) is an emerging service type that **replaces vehicle ownership**. In the supply chain, these MaaS companies are upstream at the end and **represent distributors**. However, many of these companies operate in a hybrid model where they are also heavily involved in hardware and software production. In fact, some companies even have their own production facilities and software development departments.

The companies in this classification **differ primarily in the type of vehicle and rental options offered**. The common micro-vehicle offered is the e-scooter, and the standard revenue model used is pay per trip.

Customer Segments

The ultimate customer segment of MaaS model companies are the end-users. In many cases institutions are targeted first, as they act as intermediary

Sources: 1) Own analysis through: Bird, 2021; Voi Technology AB, 2021; TIER Mobiltiy AG, 2021; 2) Nextbike GmbH, 2021; 3) Heineke, Kloss, & Scurtu, 2020



Institutions

The customer segment of institutions in the MaaS model is **similar to that of the platform model** - large companies or public institutions that want to offer new sustainable transportation options.

The main difference to the customer segment in the platform model is that the **institutions here do not want to run the business themselves**. Instead, they hire MaaS companies to integrate a fleet in their community.

A **large customer segment is represented by cities** looking for a complementary means of transport to their public transport systems. For instance, firms like *Nextbike* attract these intuitions by offering low fares[2)].

End-users

The **ultimate end-user is the individual rider**. For instance, if a university hires a MaaS company to implement a scooter-sharing system for their community, the direct customer is the university, while the individuals remain the end-users.

The end-users of MaaS are **mainly millennials living in urban areas**[3)]. Micro-vehicles provide them with an environmentally friendly transportation option that is also fun when considering e-scooters.

While the general public has been sceptical of e-scooters, **millennials have immediately adopted these vehicles**. This is attributable to their openness to innovation.

Channels

The respective app design, website presentation and presence of vehicles on the street are the primary communication channel with end-users

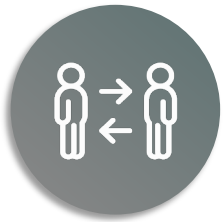
Sources: 1) Vaughan, 2020

App

The respective apps are **one of the main communication channels** for MaaS companies. Even if the specific app designs differ, they can be **characterized by a simple user interface and an appealing design**. For most companies, the apps are the only channel through which their sharing service is available. **Contacting the respective help center** through the app is usually also possible.

Website

The respective websites contain **extensive information about the company, its products and its image**. In addition, blogs and press releases can be accessed for communicating with stakeholders and keeping them informed[1)]. Firms like *Bird* have also integrated an online shop. More generally, the overall **web design** is also a tool for communicating with the customer and representing the brand.



Presence

Branded micro-vehicles of MaaS firms in the cities where they operate represent another communication channel. The **presence of the vehicles on the streets**, their design and their quality have a significant impact on customer perception. When entering new markets, **direct marketing** is a popular strategy. This involves distributing flyers with promo codes throughout the entire target market.

Value Proposition

Enabling customers with a cost-efficient, environmentally friendly, highly accessible mobility solution is the value proposition of MaaS model companies

Sources: 1) Madapur, Madangopal, & Chandrashekar, 2020; 2) Mi & Coffman, 2019; 3) Liao & Correia, 2020

VALUE PROPOSITION

Mobility

The provision of micro-vehicles in urban areas has **solved a fundamental problem**, namely that of the first and last mile[1]. Thus, **previously infeasible trips are now made feasible**.

This solution offers an entirely **new way of being mobile and getting around**. Compared to the alternatives such as walking or cycling, the micro-vehicles have great advantages.

Environmental

Since most of the micro-vehicles offered are **electric modes of transportation**, they also support a greener world. As presented earlier, most micro-vehicles are electric scooters.

Other aspects in which micro-vehicle sharing support a more sustainable world are that sharing **reduces overall resource needs**[2], **and the potential substitution of cars**[3].

Cost-efficient

The **use of shared micro-vehicles is more cost-efficient than owning a vehicle**[3]. Customers do not have to buy a vehicle and bypass reoccurring costs such as maintenance or insurance.

When these micro-vehicles are combined with public transportation instead of using a car for the entire trip, **comparatively, it is also cheaper**.

Availability

Since most companies operate worldwide, their **services can be used globally**. In particular, the most established MaaS companies like *Bird* or *Lime* are present almost everywhere.

On a community-wide view, **availability and accessibility are also very high**. A ratio indicates how many vehicles minimum must be provided per inhabitant.

Key Partners

Since the competitive environment is intense, investors play a decisive role. Additionally, public institutions play a key role for MaaS companies

Source: 1) Reck, Haitao, Guidon, & Axhausen, 2021; 2) Bysko, 2021; 3) Ho, 2018

Investors[1)]

Since the competitive landscape is intense, it is vital to make sound strategic decisions. Here**, investors contribute experience and an extensive network** facilitating operations and entry into new markets. This asset-intensive business is characterized by rapid market expansion strategies and price competition. All of this **requires an immensely high level of capital investment**.

Public Institutions

Since MaaS companies need **licenses from the authorities**[2)], the respective **cities are key partners**. Another aspect is that public transport systems are mostly operated and owned by cities. Therefore, a close relationship with them is **necessary to integrate micromobility successfully**. In addition, the data collected will also be shared with public institutions to improve the overall transportation service.

MINOR PARTNERS

Manufacturers

The **platform companies providing software** or the **vehicle manufacturer** are key partners. However, some MaaS companies have also integrated such departments.

Insurance[3)]

Since micro-vehicles are usually distributed on public roads, adequate insurance is important. **Protection is necessary as vehicle abuse or theft are common**.

Payment processors

A close relationship to the payment processor is crucial, as a big part of **customer value is represented by the convenient payment methods** on the respective apps.

Key Resources

Key resources for MaaS firms can be divided into tangible, financial and human resources, with the physical resource vehicle fleets being the most important

Sources: 1) Bysko, 2021 2) Musulin, 2020 3) Bird Rides, Inc., 2020

Fleets

Vehicles are the essential resource for MaaS companies. They represent a tangible resource that is crucial for providing a micro-vehicles sharing system and the associated customer value propositions.

Local Permits

MaaS companies require local permits to operate their services[1]. Therefore, these permits are crucial for sustainable operation in a given city. These permits contain local regulations that must be complied with.

Financing

Financial resources are necessary to invest in new technologies and to implement business strategies. These financial resources are critical to sustain in an industry with strong competition.

Manufacturers

Manufacturers concern soft- and hardware developers. They play a crucial part downstream of the supply-chain and are required to get a high-quality fleet and platform.

Fleet Managers

Most micromobility companies rely on so-called fleet managers[2]. Most operational tasks such as collecting, charging, repairing and distributing the micro-vehicles are done by them[3].

Employees

The management team of MaaS model firms usually has extensive experience in the mobility sector and represent a human resource. Their strategic decisions are crucial for the success of the respective company.

Key Activities

Besides the daily business, marketing and communication with important partners are the most important activities

Sources: 1) Lawrence, 2020

Marketing

MaaS firms are directly in contact with customers and are highly dependent on their perception. In a competitive environment like micromobility, marketing becomes crucial as it is **one way to differentiate**[1]. Therefore, MaaS providers need to follow a good marketing strategy in order to be successful – **especially when entering new markets**.

Maintenance

After the initial marketing efforts, **follow-up strategies must be pursued to maintain brand awareness**. In addition, MaaS model firms need to **ensure soft- and hardware's state of the art**. To achieve that, close contact with the developers is required. **Day-to-day maintenance** of the fleet and customer relations are additional responsibilities.

Communication

MaaS companies must be in **close exchange with their software and hardware developers**, as new technologies or updates must be coordinated in close contact. In addition, **fleet managers**, who run a big operational part of the business, need a certain level of control and monitoring. **Communication with end-users** is also crucial to ensure customer satisfaction.

Revenues

Revenues are created via different revenue models such as pay-per-trip, subscription, advertising, retail or franchise

Sources: 1) Heineke, Kloss, Scurtu & Weig, 2019; 2) Schellong, Sadek, Schaetzberger, & Barrack, 2019; 3) Nextbike GmbH, 2021; 4) Bird Rides, Inc., 2021

Revenue components[1)]

SHARING
+ Unlocking fee
+ Per minute fee
+ Subscription packages

FRANCHISING
+ Initial purchase (vehicles and software)
+ Revenue share model

SELLING
+ Branded vehicles

ADVERTISING

Comment

The **largest share of revenues is generated from the classic micromobility sharing business**. Typically, it consists of an activation fee and an additional fee per minute[2)]. There are also subscription packages that can be purchased in advance to reduce these fees or provide a certain number of free rides.[3)]

The larger players also use a **franchise model**, where they leverage their expertise and brand reputation to offer individuals the opportunity to operate their own fleet[4)]. In this way, MaaS companies earn through the initial purchase of vehicles and software and a revenue share model.

Another channel for generating revenue is **through selling**. Many MaaS companies like *Bird* also sell their branded e-scooters and e-bikes. Beyond that, it is even possible to buy company-specific merchandise.[4)]

Advertising space on their vehicles can be offered to companies to generate additional revenue.

These are **all possible options to generate revenue**. Typically, companies do not utilize all of these options.

HELBIZ Pricing Scheme

Pricing for the usage of micro-vehicles mostly consists of an initial unlocking fee and a fee per minute

Sources: Helbiz, 2021

EXEMPLARY PRICING SCHEME FOR MICRO-VEHICLES

E-SCOOTER

Unlocking fee **1€** + Price per min **0.30€**

Average trip distance **1.9km**

E-BIKE

Unlocking fee **1€** + Price per min **0.30€**

Average trip distance **3.9km**

SCOOTER

Unlocking fee **0€** + Price per min **0.26€**

Average trip distance **8.0km**

Costs

For electric micro-vehicle providers, charging costs are substantial. Other cost positions include vehicle repairs, marketing and costs for fleet managers

Sources: 1) Heineke, Kloss, Scurtu & Weig, 2019; 2) Wilhelm, 2018

Cost components[1)]

COST OF GOODS SOLD

- Charging
- Repair
- Credit card processing
- Regulatory costs
- Customer support
- Insurance
- Vehicle depreciation

OPERATING COSTS

- Sales and marketing
- Research and development
- General and administrative

MAIN COST SOURCE

Maintenance[2)]

E-scooter providers, which make up the majority of MaaS companies, face **immense charging costs**. In *Bird's* example, charging costs alone account for 47% of the cost of sales. In addition, **vehicle repair** is also a major cost that applies to all micromobility providers, regardless of the type of vehicle offered. At the company level, **marketing costs** are also a high cost position. Primarily due to the low differentiation of the service offerings, MaaS companies spend large amounts on their marketing strategy. Some of the operational tasks can be outsourced to **fleet managers**. In such cases, these fleet managers also represent a significant source of costs.

As charging represents a high cost position, **costs highly depend on whether the vehicle is electric or human-powered**.

Advantages & Vulnerabilities

Although the simplicity of the business model brings many benefits to MaaS companies, the associated vulnerabilities outweigh the upsides

ADVANTAGES

Simplicity

Since the companies pursuing the MaaS model offer a very simple, **straightforward service/product**, there are many connected positive side effects.

The simplicity of the business model **facilitates decision-making** for the respective management. The companies are **more agile and can adapt more quickly** to changes.

By concentrating on one service/product, a **cost leadership strategy** can be more effectively pursued. Since the number of key partners is smaller, long-term relationships can be established in which the **negotiating power is on the side of the micromobility company**. Additionally, costs can be saved since the target customer is very specific and narrowly defined. **Marketing measures can be very explicitly directed** at the main target group - millennials living in urban areas.

VULNERABILITIES

Dependence

Fleet managers are **responsible for most operational activities**, including vital tasks such as recharging and distribution. In doing so, they act as brand representatives and are **directly in contact with end-users**.

Vehicle lifespan

Although the lifespan of micro vehicles has increased, they still require a high level of maintenance. In addition, such **dockless vehicles are subject to tremendous amount of abuse and theft**. Both aspects are strong drivers of costs.

Red Ocean

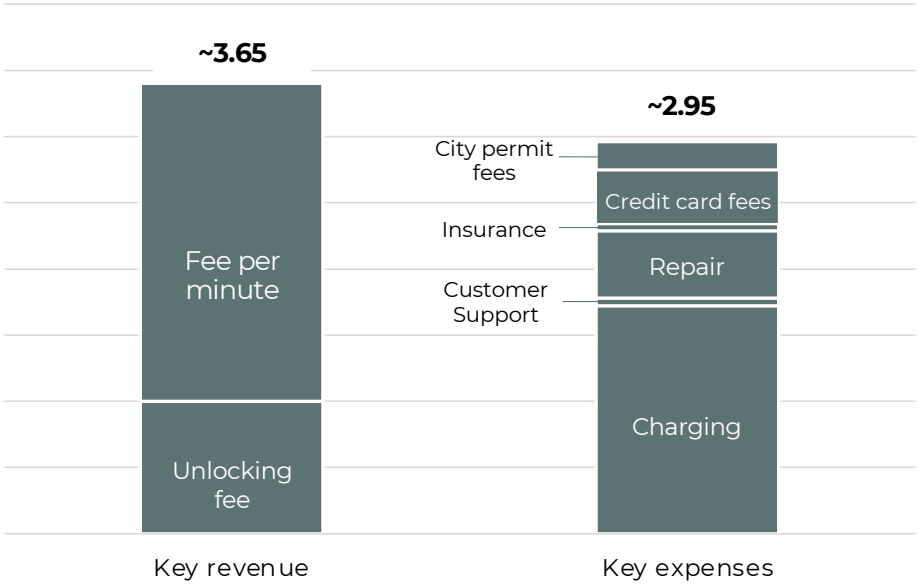
With the success of the industry, many MaaS firms have entered the market, resulting in **enormous competition with a lack of differentiating factors**. This leads to an industry where it is almost impossible to be profitable.

Profitability

Achieving profitability represents a major challenge for micromobility providers pursuing a MaaS business model

Sources: 1) McKinsey 2019; 2) Micromobility Industries, 2019

Revenue and expense estimate[1)]
(in $)



Comment

According to estimates from *McKinsey*, the profit per e-scooter ride is approximately $0.7. Assuming acquisition costs per vehicle of $400 and an average number of rides of five per day, an **e-scooter breaks even after a little bit less than four months**[1)]. However, fierce price competition among MaaS providers negatively distorts this estimate.

One **crucial part is to increase the lifespan of vehicles** as much as possible. Manufacturers and companies developing their micro-vehicles internally aim for this goal and invest considerable amounts in R&D[2)].

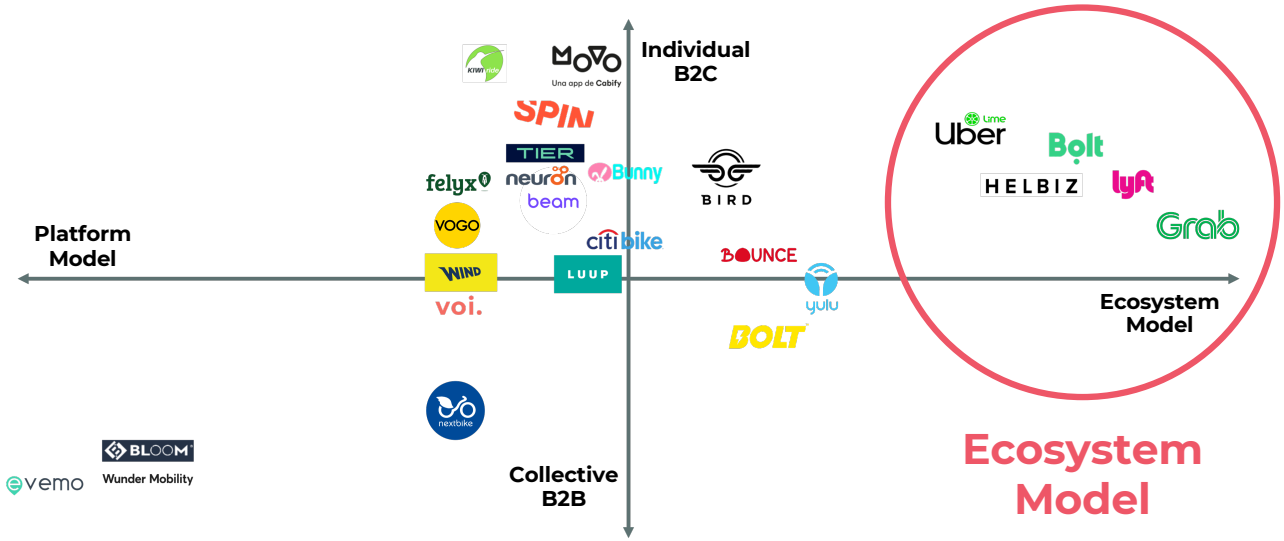
Still, most **companies are unprofitable**, although their company valuations are increasing.

MAJOR VULNERABILITY

Ecosystem Model

The ecosystem model encompasses, next to micromobility, other services mostly closely related to mobility

ECOSYSTEM MODEL CLASSIFICATION



Comment

In the ecosystem business model, **micromobility solutions are part of a broad range of products and services**. Micromobility can be the company's primary focus, but also just a smaller segment. For instance, *Helbiz's* main focus is micromobility, while *Lyft's* business focus is ride-hailing. The **other products or services of ecosystem model firms usually are related to mobility**. These can be delivery services or ride-hailing, but completely independent services are also possible.

Since the acquisition of the e-scooter company *Lime*, the **well-known company *Uber* is also included in this classification**.

Ecosystem Model

The mobility related businesses include ride-hailing, and food and grocery delivery. However, completely unrelated business segments are also pursued

Sources: 1) Bolt Technology OÜ, 2021; 2) Grab, 2021; 3) Helbiz, 2021; 4) Lyft, Inc., 2021; 5) Uber Technologies Inc., 2021

	MICRO MOBILITIY	FOOD DELIVERY	GROCERY DELIVERY	RIDE HAILING	OTHERS
Bolt [1]	✓	✓	✓	✓	✗
Grab [2]	✓	✓	✓	✓	✓
HELBIZ [3]	✓	✓	✓	✗	✓
lyft [4]	✓	✓	✓	✓	✓
Uber [5]	✓	✓	✓	✓	✓

Comment

The table on the left compares the companies with an ecosystem model in terms of their services.

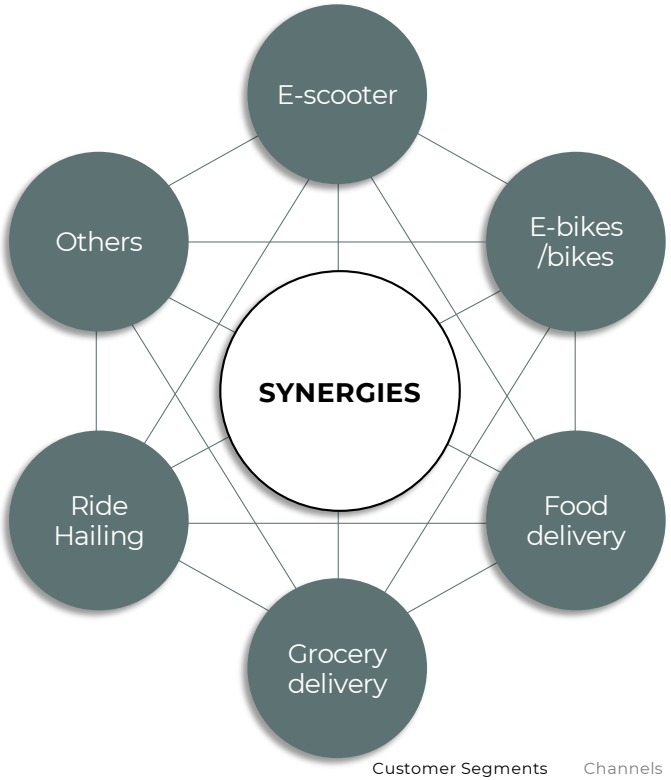
In addition to micromobility, **all companies are also involved in food and grocery delivery**. The only deviation is *Helbiz*, as they do not offer ride-hailing. In addition, **all of the companies mentioned**, except for *Bolt*, **operate in the "other" category**. *Grab*, for example, is additionally active in the payment industry, or *Helbiz* also offers sports streaming services.

Nevertheless, it is noticeable that the **overall focus of the companies analyzed lies on mobility services**.

As the companies in the ecosystem model operate in many different segments, this analysis will also touch on **business segments unrelated to micromobility**.

Customer Segment

Through synergy and spillover effects from other business segments ecosystem model companies are operating in, the MaaS customer segments can be extended



Comment

The customer segment of ecosystem model companies is **similar to the MaaS model when considering micromobility services**. However, the **customer segments within the various other business segments differ**. Nevertheless, ecosystem model companies can benefit from **synergy and spillover effects between the business segments**. Thereby, customers of one business segment are more likely to use other services of the same company, as **external hurdles** like downloading a new app or getting used to a new app interface **are lowered**. Consequently, customer acquisition **costs** for business segments within an ecosystem model company are **reduced**. Additionally, the compatibility and demand of new functions or features can be tested with existing customer segments, facilitating future proof of concepts.

As delivery and ride-hailing services require drivers to be viable, **drivers represent an essential customer segment** located at the back-end of the business. However, this back-end segment does not fall within the scope of this report.

The importance of each customer segment in the ecosystem model, strongly **depends on the business focus of the respective company**.

Value Proposition

In addition to an environmentally friendly mobility service, ecosystem model companies offer many other services that increase convenience for end-users

Source: 1) Uber Technologies Inc., 2021

VALUE PROPOSITION

Mobility

All mobility challenges in urban areas can be solved perfectly with ecosystem model firms' mobility services.

Short distances can be covered with **micro-vehicle sharing systems**, while **ride-hailing services** can be used for **longer distances**. These two alternatives are not mutually exclusive, which is why combining the services is also possible.

Environmental

Delivery and micromobility services are usually **provided with e-vehicles**.

Also, for ride-hailing, a **shift toward electrically powered vehicles** is noticeable.

Also, these ecosystem model firms have publicly communicated **green company values**. By 2040, for example, *Uber* has set a goal to achieve zero-emissions operations[1)].

Convenience

Most services offered by ecosystem model companies can be accessed via **one single app**. The respective app interfaces are **easily understandable and easy to use**.

Next to the accessibility, **the actual mobility or delivery services contribute** to the customer's convenience. For instance, always accessible micro-vehicles or delivery services.

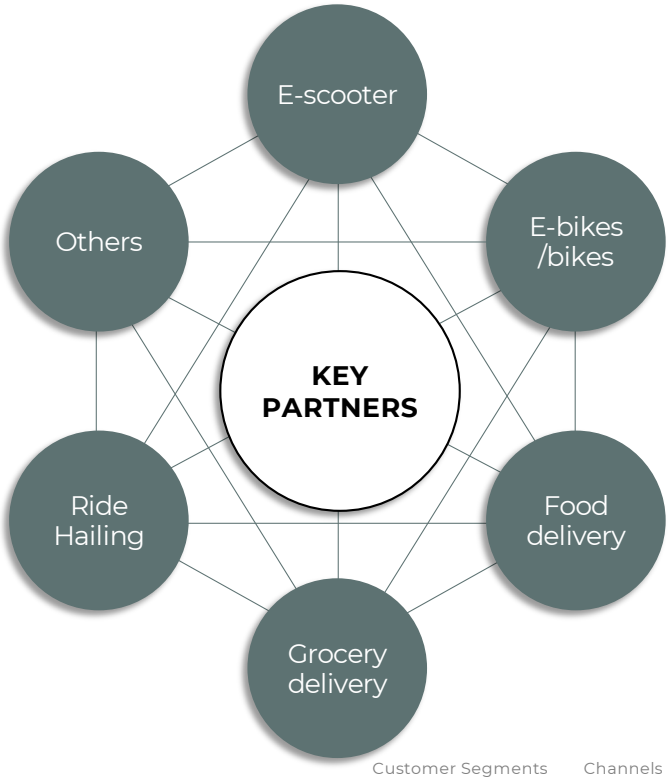
Others

The detailed description of the customer value proposition for the other service segment **depends on the type of service offered**. For instance, the sports streaming service of *Helbiz* contributes to customer enjoyment.

From a business perspective, a broad range of services **diversifies the value proposition** and thus the risk for the respective company.

Key Partners

The key partners of the MaaS business segment can be seen in the MaaS analysis. The other business segments require further key partners.



Comment

Since each service requires different capabilities, companies with an ecosystem business model also **need multiple key partners** to deliver their services. However, as most of the services are related to mobility, **many of the key partners of the MaaS model remain the same**. Nevertheless, some additional partners are required. For example, some of the necessary key partners in delivery services are drivers, restaurants, and supermarkets.

Companies with an **ecosystem model can benefit from synergies among their key partners**. For instance, delivery drivers can leverage micro-vehicles to carry out their deliveries. However, **new partnerships must be established** when companies enter completely **unrelated business areas**. These partnerships are more difficult to build because there is no connection point within the existing business.

Drivers

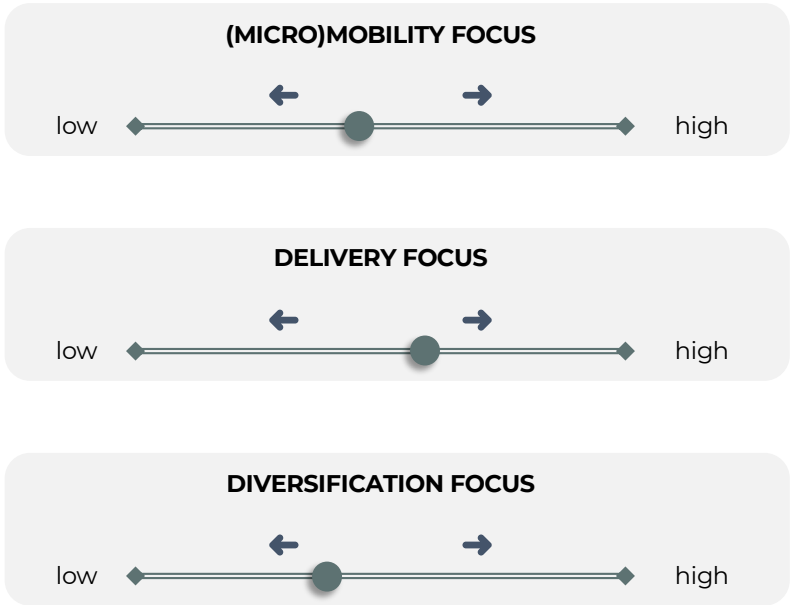
Restaurants

Supermarkets

Key Resources & Activities

Both key activities and resources depend on the company's business focus. Therefore, a general statement is difficult to make

BUSINESS ORIENTATION



Comment

Depending on the business focus of each company, the **main activities and consequently the required resources differ**. For example, *Lyft's* main activity is ride-hailing, while *Helbiz* focuses on micromobility. As a result, *Lyft's* main resource is its employed drivers, and *Helbiz's* main resource is its employed fleet managers. Nevertheless, all ecosystem models provide mobility services, which means that **many resources and related activities overlap**.

The three main characteristics in which the companies in the ecosystem model **differ are their degree of focus on (micro)mobility, delivery, and diversification**. Diversification is defined as not focusing on mobility- or delivery-related services or products. For instance, players like *Grab* are greatly diversified. In addition to micromobility and delivery services, they have also entered the cashless payment industry and are operating in the mailing industry.

It is **difficult to make a generally applying statement** about ecosystem model companys' key activities and resources.

Revenue

The three major revenue streams of ecosystem model companies come from the segments micromobility, ridesharing and delivery services

Source: 1) Heineke, Kloss, & Scurtu, 2020; 2) Ahuja, Chandra, Lord, & Peens, 2021; 3) Salas, 2021

MICROMOBILTY

The micromobility industry is expected to grow strongly[1]. Therefore, we can **expect increasing revenues through the micromobility segment** of these ecosystem model firms. The detailed breakdown of the revenue can be seen in the revenue analysis of the MaaS model.

DELIVERY[2]

Similar to micromobility, delivery services also represent a **strongly growing segment**. Here, the **majority of revenue comes from food delivery**. Nevertheless, grocery delivery services are becoming increasingly popular and will play a more important role in the future.

REVENUE

The exact breakdown of the respective firm's revenue depends on its focus. The companies' main income is represented either by ridesharing or micromobility services.

RIDE-HAILING

The initial business segment of the majority of ecosystem model companies is ride-hailing. Many companies like *Uber* or *Lyft* **generate the most revenue income from this business segment**[3]. *Helbiz*, on the other side, does not even have a ride-hailing service within their services.

OTHERS

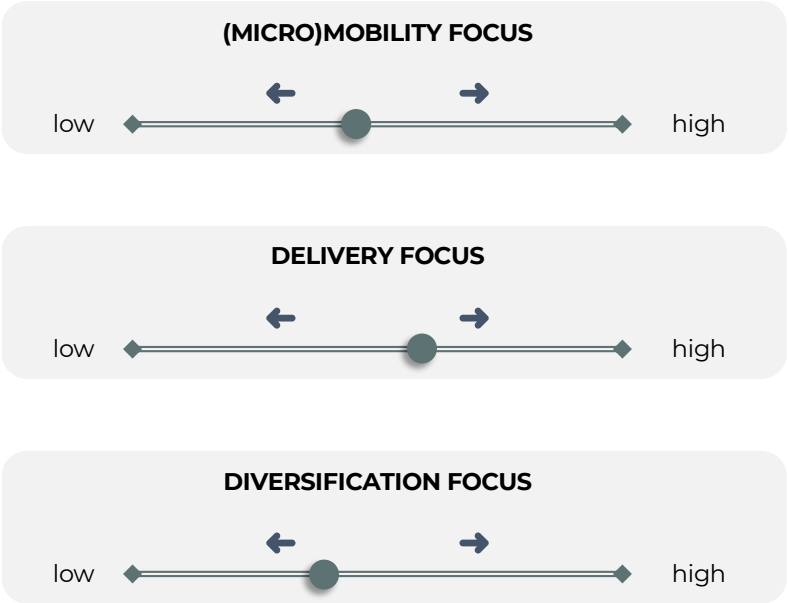
An additional revenue stream comes from the "other" business segments. However, **mostly only an unnoticeable amount**. For instance, the freight business of *Uber* represents only 9% of their revenue in 2020[1].

Costs

Next to the MaaS cost sources, additional cost positions arise from new additional business segments

Sources: 1) Talent.com, 2021

BUSINESS ORIENTATION



Comment

The cost sources in the micromobility segment of respective companies are the same as those in the MaaS model. The drivers are one **big cost driver in the mobility and delivery segment**. For instance, ride-hailing drivers of *Uber* earn ~$18.6 per hour[1)] and delivery drivers ~$17.7 per hour[1)] in the US. **Dependent on the importance and focus of the respective business segments**, costs are differing strongly. Nevertheless, due to the size of the ecosystem model companies, they can profit strongly from economies of scope. **Considering diversification, the costs sources are difficult to pinpoint**, as these business segments are almost fully unrelated to their core

As the services are unified on one digital app, the software is even more important than in the MaaS model. Therefore, the **maintenance costs for the software in the ecosystem model represent a significant stake**.

Cost synergies between the individual business segments are to be assumed. Especially between (micro)mobility and delivery as they require alike costs.

Advantages & Vulnerabilities

The main advantages are synergy effects and a broad value proposition. However, these points are offset by complexity, which brings several vulnerabilities

Sources: 1) Damodaran, 2005; 2) Shine, Park, & Robert S. Wyer, 2007; 3) Sarafin, 2021; 4) Gilibert & Ribas, 2019; 5) Ansoff, 1957; 6) Pertusa-Ortega, Molina-Azorín, & Claver-Cortés, 2009

ADVANTAGES

Synergy effects[1)]

As ecosystem model companies operate in several business areas, it has in many overlapping parts. This **enables these companies to leverage cost-saving synergy effects and utilize brand and service/product synergy effects**[2)]. In addition, the knowledge acquired in the respective business areas can be transferred and used for other new business areas.

Value proposition[3)]

The value proposition of a company that offers **multiple services or products** is naturally more comprehensive than providing a single service. Since many of the **services complement each other**, a synergy effect also results here, enhancing overall customer satisfaction[4)]. In addition, a broad value proposition diversifies risk[5)] and dependence on one single service or product.

VULNERABILITIES

Complexity

A wide range of product/service offerings can also be a drawback. The question is whether a company that focuses on many different business segments can be exceptional and successful in each of them. Companies have to face the problem that they are **stuck in the middle** - neither are they cost leaders, nor do they have a differentiation factor[6)].

In addition, the previously mentioned cost synergy effects do not come into play if the business segments are very different. In such cases, entirely new relationships must be established, and synergy effects cannot be utilized.

When the company's management must consider information from numerous sources, the **complexity of the decision-making** process is substantially increased. Not only is it more complex, but it also carries the risk of missing out on decisive information.

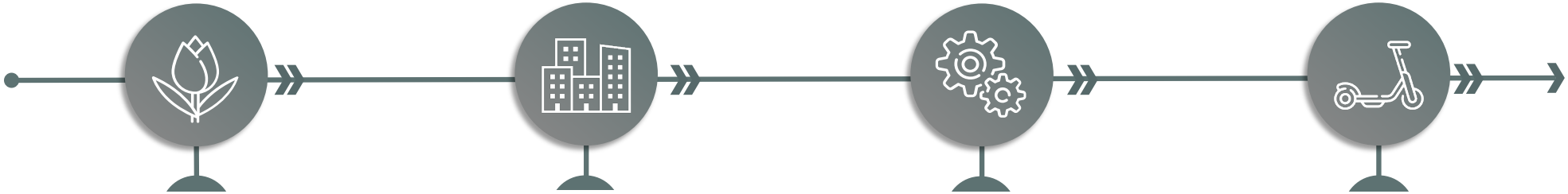
5

INDUSTRY OUTLOOK

Main Industry Drivers

The industry drivers of sustainability, urbanization, adoption and mobility are the main reasons why micromobility is expected to keep growing strongly

Sources: 1) VOI Technology AB, 2021; 2) Zukunftsinstitut, n.d.; 3) FutureBridge, 2020; 4) Oeschger, Carroll, & Caulfield, 2020; 5) Song, Cherrett, McLeod, & Guan, 2009; 6) BIS Research, 2020



Sustainability[1)]

One of the goals, pursued globally is the **reduction of CO_2 emission**. Since the vehicles are human-powered or electric, **environmental impacts are substantial** – especially considering that the micro-vehicles have the potential to replace the car.

Urbanization[2)]

More and more humans live in cities and this trend is still ongoing. As one of the so-called mega trends, this leads to an **increasing need for mobility solutions** in urban areas. In this context, micromobility with MaaS offers the perfect solution.

Adoption[3)]

The acceptance of micro-vehicles is increasing significantly – especially e-scooters had an acceptance problem which changed dramatically. Now **MaaS services are being integrated into public transport** on a large scale[4)].

Mobility

The **problem of the first and last mile**[5)] represents a real existing mobility problem. By introducing micromobility, a solid, sustainable solution has been found. The **potential is still vast**, as the market is still expected to grow tremendously[6)].

Additionally, to the above-mentioned reasons, further minor drivers contribute to the growth of the micromobility industry.

Market Consolidation

The management of the leading providers of micromobility agree that the market will consolidate

Notes: Citations from source 2) | Sources: 1) Schroeder, 2021; 2) Micromobility Industries, 2019

Caroline Hjelm
CMO, VOI

> *What I think will cause consolidation will be **regulation**. And us at VOI think that it will not only benefit us if there are fewer players, but it will **also better the environment for the users and the cities**.*

Eric Wang
CEO, Wind

> *If the **capital is constrained**, then consolidation could happen.*

Lukasz Gadowski
CEO, Circ

> *There are **too many players**. They might find **regional focuses**, some of them might consolidate like in Latin America like Grin and Yellow **to form the leader for the continent**.*

Comment

Since the **number of competitors in the micromobility industry is very high**[1], the question is whether all players can survive. Even if MaaS providers seem to emerge on a regular basis, a **recurring expert opinion is that the market will consolidate in the short- to mid-term.**

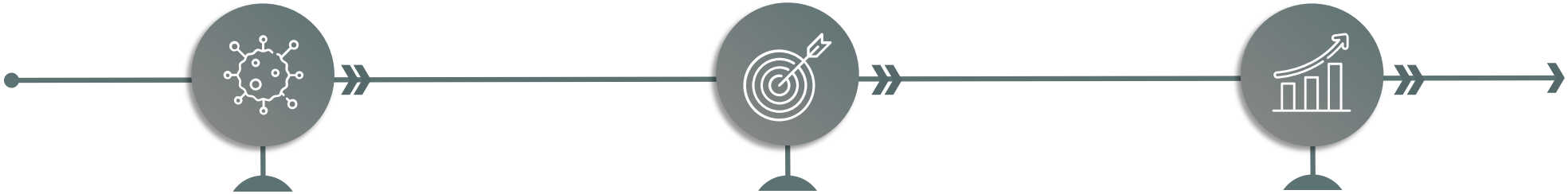
There are several reasons to support this statement. According to Lukasz Gadowski, CEO of *Circ*, one of the **possible reasons for consolidation is a strategic positioning** to take the leadership in a specific region. Eric Wang, CEO of *Wind*, sees the **lack of capital** in this capital-intensive business as a key reason companies will inevitably consolidate. Caroline Hjelm, CMO of *VOI*, also expects market consolidation. She believes the **main reason will be city regulations** aimed at having fewer players in a respective city[2].

Industry consolidation is already ongoing, and Covid-19 has had a significant impact.

Market Consolidation

The lack of profitability and differentiators are the primary reasons for market consolidation. These two factors have been exacerbated by the impact of Covid-19

Sources: 1) Citron, 2020; 2) Heineke, Kloss, & Scurtu, 2020; 3) CB Information Services, 2021



Impact of Covid-19

The global lockdown had major impact on the micromobility industry. Companies such as *Lime* had to **stop their operations** in major markets[1]. Some **market players lost 80% of the valuation** or had to lay off up to 30% of their staff[2]. These up-to-now **unprofitable companies were put in even more financial distress**.

Market Opportunities

For larger players, the aforementioned devaluations combined with the lack of profitability of the micromobility companies, created **opportunities for acquisitions**. In this regard, for example, *Bird* has acquired *Circ* and *Scoot*[3]. The firms that survived the Covid crisis were able to **streamline their businesses**, **become leaner and grow externally**.

Future

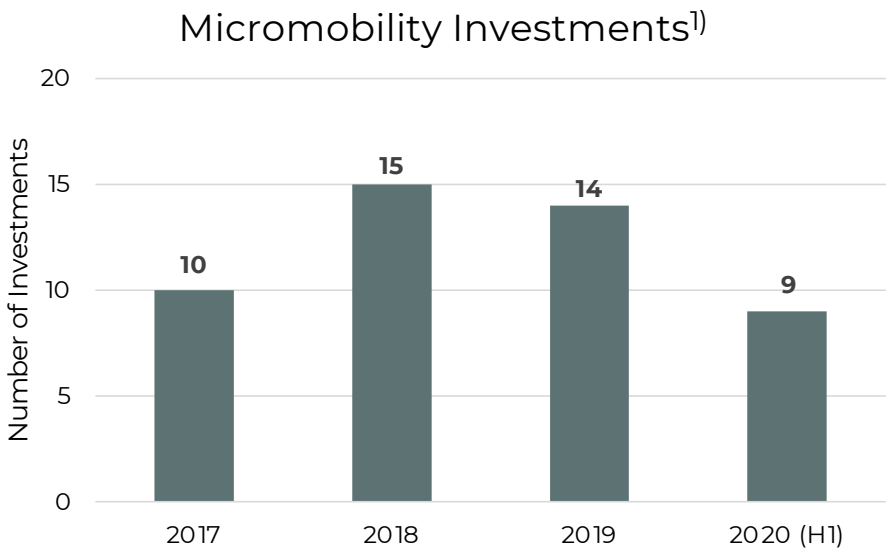
Competitors have **few differentiating factors**, which is why **fierce price competition** is waged to achieve a high market share and to exploit network effects. In the long term, such **business strategies are not sustainable**, and the companies will either go bankrupt, be bought out or grow through acquisitions.

In addition, **investors are seeking reasonable returns**, which is impossible with current business practices. Accelerated by Covid-19, the **lack of profitability** is inevitably leading to **greater consolidation in the micromobility market**.

Investment Landscape

In recent years the number of investments in micromobility have been continuously high. This development underlines further growth for the industry

Sources: 1) Netscribes, Inc., 2020



Comment

The number of **investments in micromobility is increasing**. Since the establishment of the term in 2017, *Netscribes counted* 48 startups that have received funding until the first half year of 2020. For the first half year of 2020, despite Covid-19, they registered already nine investments, indicating a **continued positive development**.

Not only are the numbers of investments high, but also the valuations. The most prominent companies are *Lime* and *Bird*. Even if their operations are not profitable yet, a more consolidated market with fewer players promises high returns.

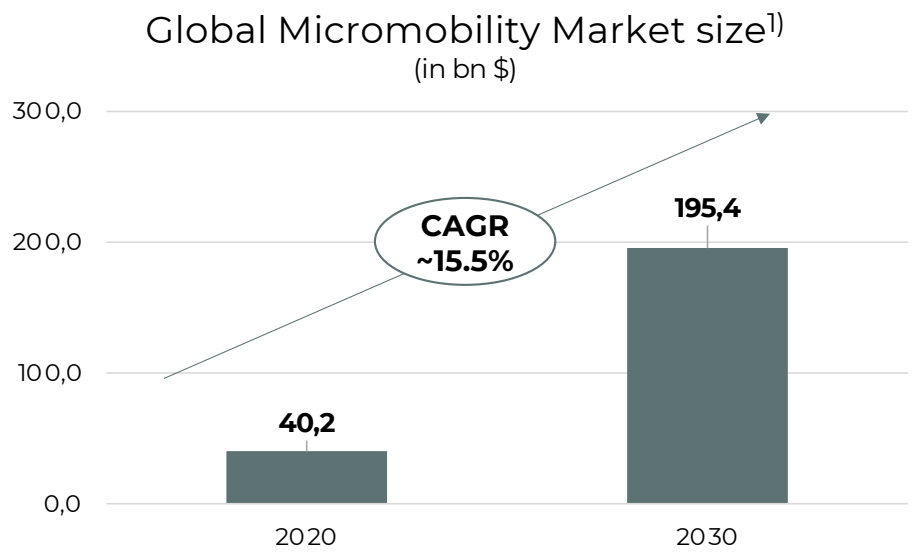
The names and reputation of the **investors in micromobility is also impressive**. Most famous names like *Sequoia Capital* or *Bain Capital Investors* come up when talking about lead investors of micromobility firms.

The **high number of investments** from various sophisticated investors worldwide **emphasizes the attractiveness and prospects** of the micromobility industry.

Future Outlook

The global micromobility market is expected to reach $195.4 billion in 2030. However, new Covid-19 variants such as Omicron pose high risks and challenge current forecasts

Note: CAGR calculation adjusted internally | Sources: 1) Singh & Mutreja, 2021; 2) Heineke, Kloss, & Scurtu, 2020; 3) The Economist Newspaper Limited, 2021



Comment

The global micromobility industry is forecasted to grow strongly over the next years, reaching a **value of $195.4 bn in 2030**. This represents an **annual growth rate of ~15.5%**. The industry is strongly driven by the aforementioned drivers.

The Covid-19 pandemic has had a tremendous impact on the micromobility industry[2)]. Looking at km traveled, there has been a massive decline of 50-60% from the first occurrence until early 2021. Although Covid-19 had a significant impact in the short term, the industry is expected to recover in the medium term fully. For instance, an analysis by ***McKinsey*** **suggests a full recovery from 2021 to 2022**. However, this analysis did not consider new mutations such as the current Omicron variant[3)]. Nevertheless, the impact is not expected to be as dramatic as when Covid-19 first occurred.

Forecasts for the industry remain very uncertain as Covid-19 mutations continue to be a major risk. However, companies and governments have adapted, so the **potential negative impact will not be as severe as when Covid-19 first appeared**.

7

CONCLUSION

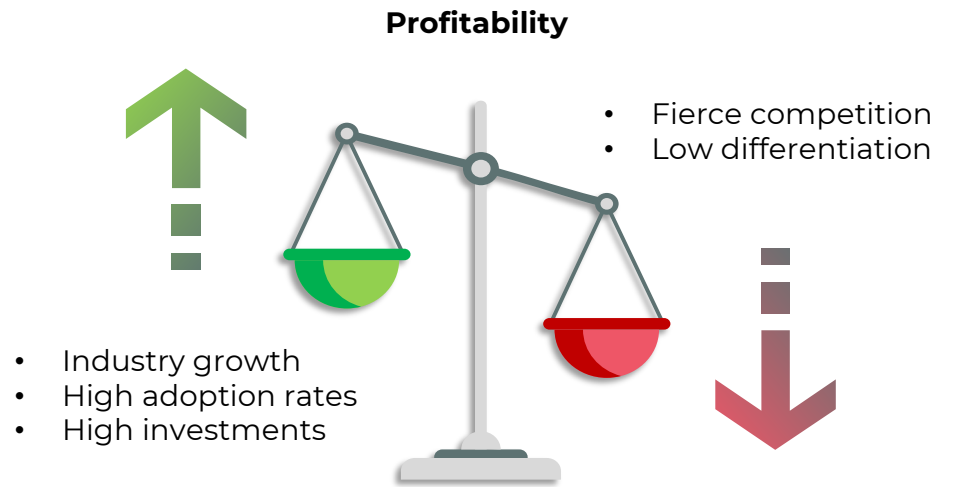
KEY INSIGHTS, LIMITATIONS, EXTENSIONS

Key Insights

The micromobility industry offers desirable market characteristics. However, companies in this industry are struggling to become profitable

UNPROFITABLE BUSINESSES

Despite strong growth rates, high adoption rates and high investments in micromobility, **profitability among MaaS providers cannot be achieved**. Fierce competition with low differentiators are the main reasons.



Comment

The aspects of the **industry outlook all suggest a highly profitable industry**. However, even the largest and most hyped MaaS providers like *Bird* are still net income negative.

The main reason for this is the **low profit margins** with which the companies operate. Since there is hardly any differentiation and the companies essentially offer the same service, price is the only way to compete. This fierce price competition is the main reason that leads to the low profit margins mentioned above.

Additionally, investors often disregard profitability, and companies are **measured only by their market share**.

Key Insights

The low degree of differentiation leads to low customer loyalty. Customers base their decision mainly on the proximity and price of the vehicle

Sources: 1) Micromobility Industries, 2019

LACK OF DIFFERENTIATION

Micromobility companies involved at the **end of the supply-chain**, **lack differentiating characteristics**. The offered services are very alike, and **no major unique selling points** to competitors are created.

André Mozzaglia
Student

I don't make any differences between the e-scooter companies.

Pedro Duarte
Employee

I choose the cheapest. That's BOLT at the moment.

Rongbiao Li
Consultant

There are no major differences for end-customer. This lack of differentiation leads to no customer loyalty at all.

Comment[1)]

The MaaS operators, especially the e-scooter providers, **exhibit a very low degree of differentiation**. The features touted by the companies themselves, such as the quality of the vehicle or customer service, ultimately have only little influence. The end-customer **bases his decision on two factors**: **proximity** of the vehicle and **price** of the provider. This implicates a **low level of customer loyalty** in this market.

The actual differences between the micromobility companies do not affect the end customer but are of a strategic nature. With a lack of differentiation, strategic decisions are even more critical and determine success or failure.

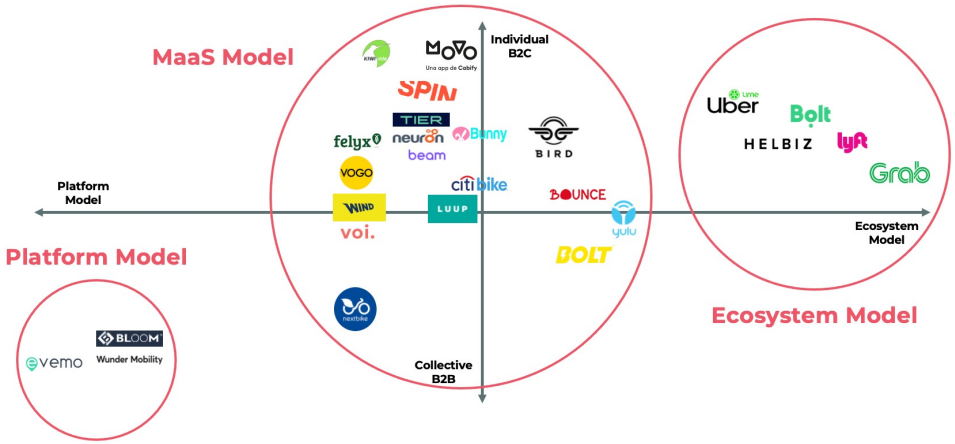
Key Insights

Three business models were identified by mapping micromobility companies onto a coordinate system with two defined dimensions

MICROMOBILITY BUSINESS MODELS

Three business models have been identified in the micromobility industry. **The so-called platform model, the MaaS model and the ecosystem model** mainly differ in two dimensions – target customer and product range.

Business Model Overview



Comment

Three business models could be identified by mapping micromobility companies on a perceptual map. The metric for this was the range of products from low to high on the x-axis and the target customer on the y-axis. The dimension target customer was distinguished in B2B and B2C. The **platform model played a special role** in this overview as they lay upstream of the supply chain and target B2B only.

It is worth noting that **ecosystem model companies offer a wide range of products or services, including MaaS**. Therefore, their MaaS branches have the same characteristics as MaaS model companies, and the given recommendations for MaaS also apply to ecosystem model companies.

Limitations

The analysis of the micromobility industry contained several limitations, mainly due to the fact that this industry is still emerging and relatively new

Lack of financial information

Since most of the firms studied are not publicly listed, **access to financial information was limited**. Particularly when examining the ecosystem model firms, it would have been interesting to find revenue or cost breakdowns by business area to obtain information on synergy effects. However, information in this regard was almost non-existent.

Limited scientific information

Since this industry is relatively new, **scientific information was limited**. There are only a few articles on micromobility in well-known and high-ranked journals. In the few cases that apply, industry business models were not examined. Therefore, this research relied mainly on industry reports, company reports, and expert interviews.

Difficult predictable industry

To draw well-founded judgments, the industry would have to have existed for a longer period. Therefore, there is **still a lot of uncertainty**. This uncertainty has been and is still being **intensified by the Covid-19 pandemic**. Thus, forecasts are only partially reliable and still depend on many unpredictable influences.

Varying definitions

Since the term micromobility itself is relatively new, there is **no uniform definition**. Besides, also **different definitions for the term "micro-vehicle"** exist. These differences make it difficult to draw conclusions from sources because it is **unclear what definition the author refers to**. However, by defining an own scope, this limitation could be mitigated.

Extensions

This report could be extended by a broader research scope, an updated analysis, surveys, and further interviews

Broader scope of research

The scope of the study could have been broadened by **including other complementary mobility industries** such as the automotive industry or public transport. An investigation of how these industries react to the emergence of micromobility and how they are affected by it would be interesting in order to obtain a more holistic picture of mobility in general.

Updated analysis

Understanding consumers and industry forces formed the foundation for this report and the final recommendations.

Because we are still in an uncertain time with Covid-19, the accuracy of **many statements from reports or articles written before or during the pandemic must be verified** post pandemic.

Surveys

The analysis **could be enhanced by incorporating surveys** to understand better how customers perceive micromobility services.

Especially, to get a wide range of opinions on the business model innovation “tourism mode” a **survey could serve as proof of concept** and basis for further improvements.

Interviews

The analysis can be expanded by conducting **interviews with experts downstream of the supply-chain**. For instance, with micro-vehicle manufacturers to get more insights about the hardware part of the service. Additionally, an **interview with an invested VC** could disclose the KPIs investors look for within a micromobility investment.

APPENDICES

1

INTRODUCTION

Environmental Impact

The environmental impact of micromobility is positive. Cars are being replaced and public transportation is supported

Sources: 1) City of Portland, Oregon, USA, 2018; 2) VOI Technology AB, 2021; 3) Moreau, et al., 2020; 4) Holmgren, 2020; 5) ITF, 2021

MICROMOBILITY

Cars

Several surveys show the impact that micro-vehicles have on current transit, particularly the way how **cars are being replaced as a mode of transportation**.

The *Portland Bureau of Transportation* found that 34% of survey respondents said they would have taken their own car or a cab if e-scooters were not available[1].

Data collected by e-scooter provider *VOI* indicates a **15.3% increase in car replacement rate** in Europe by 2020, and there is no end to this trend. A recent study in Oslo found that more than 65% of respondents said they use their cars less when e-scooters are around.[2]

Public Transportation

Micromobility has a **huge impact on public transportation**. These impacts are on the one hand pro public transport, and on the other hand contra.

For instance, some surveys show that e-scooters have a negative impact on public transport. In a survey conducted in Brussels, researchers found that 30% of users use **e-scooters instead of public transport**[3].

An important pro aspect is that the presence of e-scooters increases accessibility to public transport[4], by increasing the catchment area of public transport[5]. Therefore, micromobility works a **complementary part to public transport**.

As cars are still predominantly gasoline-powered, while micro-vehicles are either human-powered or electric, the replacement of the car and increased accessibility to public transit is **contributing to a more sustainable way of traveling**.

International Vehicle Classification System

Source: Santacreu, 2020

International vehicle classification				
	U.S.	**Latin America**	**Europe**	**Asia**
E-bikes	**Distinction in 3 categories:** • Class 1: E-bike with motor that provides assistance only when rider is pedalling and stops assisting when speed of 32 km/h is reached • Class 2: E-bike with motor intended to be used only to propel the bicycle and cannot provide assistance when bike reaches speed of 32 km/h • Class 3: E-bike with motor and speedometer that provides assistance only when rider is pedalling, no longer provides assistance when bike reaches 45 km/h	Countries classify micro-vehicles relating to the speed developed: **Mexico**: • Non-motorized vehicle is one able to develop autonomously a speed of max. 30 km/h • A vehicle that exceeds 30 km/h is considered motorized and needs a license plate, registration and must follow car rules **Colombia:** • Motor power up to 300 W • Weight up to 35 kg • Max. speed up to 25 km/h	EU regulation established L-category vehicles as a reference for member countries: **L1e-A:** • Max. speed of 25 km/h • Power between 250 W and 1000 W	**China:** • Working pedals • Max. speed of 25 km/h • Max. weight of 55 kg • Max. motor power of 400W • Max. battery voltage of 48V **Korea**: • Power driven vehicles classified as motor vehicles • UNECE regulation is used to classify vehicles
E-scooters	Speed limit vary by state and range between 20 km/h to 32 km/h	**Classification as PMDs:** • electrical motorised individual vehicles • with one or more wheels • Max. speed of 25 km/h	**L1e-B:** • Max speed of 45 km/h • Power of 4000 W	**Singapore**: • Classified as PMDs (Personal Mobility Devices)

E-scooter Focus

In the U.S., trips on shared bikes, e-bikes and e-scooters increased by 60% from 2018 to 2019. Thereby, e-scooters play the most essential role

Sources: 1) NACTO, 2020

Shared micromobility ridership growth[1)]

(2018-2019, United States, in million of trips)

Comment

In 2018, the number of e-scooter share trips was 37 mio. This accounts for 10 mio less rides, compared to bike share.[1)]

The **scooter rides in 2019 skyrocket**ed with a growth rate of over 132%, reaching a total of 86 mio rides. On the other hand, the number of **bike rides almost stagnated**. It only slightly increased by 3 mio from 47 mio to 50 mio. Overall, the number of micromobility trips are increasing strongly.[1)] However, 2020, due to the pandemic, represented an exception. The restrictions and lockdowns led to decreases of 50-60% of passenger-kilometer traveled. Nevertheless, experts claim that this industry will emerge stronger from the Covid-19 crisis.

This development underlines the **importance of e-scooters** in the micromobility industry.

Interviewees

Five individuals were interviewed to get a consumer point of view of the industry

André Mozzaglia

Student

Regular user

”With the implementation of e-scooters in Carcavelos I can get to Nova faster”

Julika Diano

Employee

Occasional user

“E-scooters are the means I use most frequently to get around the city”

Pedro Duarte

Employee

Regular user

“I use e-scooters regularly to get to my office”

Giulia Croxatto

Entrepreneur

Regular user

“I use e-scooters more than I use my car or any other vehicle”

Vladyslav Chernyshov

Employee

Regular user

“Apart from my age I regularly use shared e-scooters”

3

INDUSTRY BUSINESS MODELS

Industry Overview

Company	Products	Target Customers
acciona	E-mopeds	Individuals
beam	E-Scooters, E-Bikes	Individuals, Cities
BIRD	E-Scooters, E-Bikes, Long-term rental option, Buying Option	Individuals
BLOOM	Stand-alone platform, Ready to use platform	Entrepreneurs, Businesses
Bolt	Scooters, E-Scooters, E-Bikes, Ride-hailing, Food Delivery, Leasing Options	Individuals, Restaurants, Drivers, Cities, Public Institutions, Businesses
BOLT	Scooters, E-Scooters, E-Bikes, Delivery, Leasing Options	Individuals, Cities, Businesses, Public Institutions, Restaurants
BOUNCE	Powered scooters, Buying Option, Platform sharing	Individuals, Scooter Owners

Company	Products	Target Customers
Bunny	E-scooters, Long-term rental	Individuals
citi bike	Bicycles, E-Bicycles, Long-term rental	Tourists, Commuters, Businesses
cooltra	E-mopeds, Mopeds	Individuals, Businesses
felyx	Scooters	Individuals, Businesses
Grab	E-scooters, Food/Grocery delivery, Ride-hailing, Logistics, Online payment, E-commerce	Individuals, Businesses
HELBIZ	Scooters, E-Scooters, E-Bikes, Food Delivery, Buying Option	Individuals, Cities, Businesses,
KIWIride	E-scooters	Individuals

Industry Overview

Company	Products	Target Customers
Uber Lime	Scooters, E-Scooters, E-Bikes	Individuals, Businesses, Property Developer
LUUP	E-scooteers, E-bikes	Individuals, Businesses (for charging spaces)
lyft	Bikes, E- Bikes, Scooters, Ride-hailing, Food Delivery, Car rental	Individuals, Businesses
Movo Una app de Cabify	Scooters, E-scooters	Individuals
neuron	E-Scooters, E-Bikes	Individuals, Cities
nextbike	Bikes, E-Bikes	Cities, Public Institutions, Universities, Businesses
SPIN	E-Scooters, E-Bikes	Students, Individuals

Company	Products	Target Customers
TIER	Scooters, E-Scooters,	Individuals, Businesses
evemo	Mobility Platform (Ecosystem model)	Businesses, Municipalities, Public Utilities
VOGO	Scooters	Individuals
voi.	E-Scooters	Individuals, Businesses
WIND	E-scooters	Individuals, Cities
Wunder Mobility	Stand-alone platform, Ready to use platform	Municipalities, Public Utilities
yulu	Bikes, E-Bikes, Mopeds,Long-term rental Advertisement	Individuals, Cities, Universities, Businesses

4

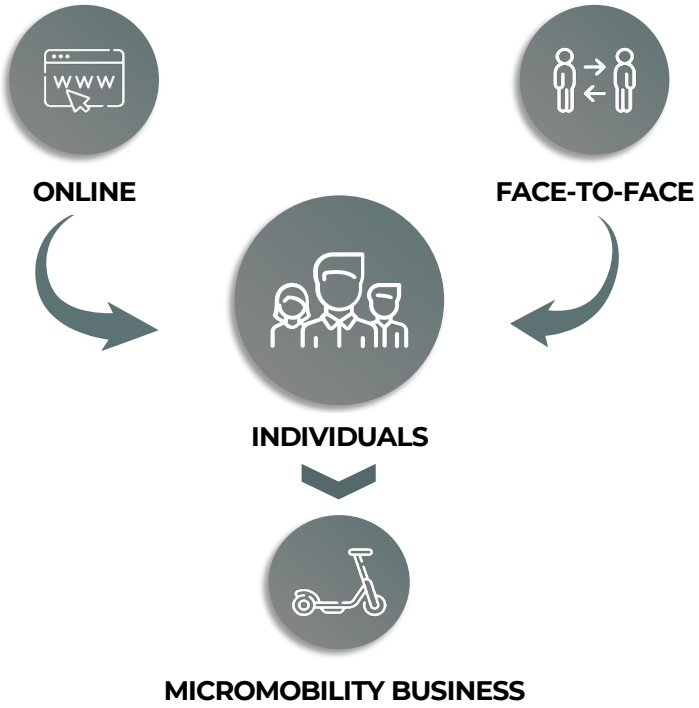
BUSINESS MODEL ANALYSIS

MAAS MODEL, ECOSYSTEM MODEL

PM: Channels

Platform model companies approach their customer segments via a combination of online and face-to-face communication channels

Sources: 1) Wunder Mobility, 2021



Comment

Social media platforms are ideal for targeted outreach to individual entrepreneurs and professionals, seeking to offer mobility solutions. Platforms such as LinkedIn and Twitter are best for direct communication. Facebook and Instagram are best for advertisement/marketing purposes.

The **websites are used to provide detailed information** and allow potential customers to contact platform providers online. Companies such as *Wunder Mobility* have their own blog and publish various articles about urban mobility. Thereby, they raise additional brand awareness in the micromobility industry next to communicating with stakeholders and shareholders[1].

In contrast to online platforms, **conventional channels** such as conferences, exhibitions, phone calls and direct messages are most effective for reaching public institutions and larger corporations.

The communication channels for platform model firms are essential, as this is how they maintain old customers and acquire new ones. Nevertheless, customer acquisition costs are very high in this segment.

PM: Customer Relationships

Close guidance from the start to aftersales is essential for platform companies to ensure customer satisfaction and thus success

Sources: 1) Buchberger, 2020; 2) Strategyzer, n.d.; 3) Wunder Mobility

We pick up the phone even after your successful launch, and you'll receive on-demand help from the Wunder Mobility team whenever you need.

Nele Toebelmann
WUNDER MOBILITY

Marketing Initiatives → **Initial Contact** → **Demo & Testing** → **Closing** → **Roll-Out** → **Customer Success**

Comment

Above, the B2B SaaS sales process has been illustrated. The first contact starts after the marketing initiatives have been successful. From then on, every step must be **closely accompanied by the sales manager** resp. the customer success manager. This means that after the actual sale, providing support is essential.[1)]

Customer relationships are a decisive factor for the success of platform companies. As these are long-term relationships, customer satisfaction must be guaranteed from the initial consultation through to aftersales.[2)] In this business model, each customer receives **dedicated personal assistance**, which represents the deepest and closest possible relationship between provider and customer.

Hence, companies like *Wunder Mobility* need to be **highly reliable in all circumstances and be in constant exchange** with its customers[3)]. Especially since the service is personalized, close and continuous communication is crucial to be successful.

MaaS: Channels

The versatility of online marketing is being utilized and represents an essential part of the communication strategy of MaaS companies

Sources: 1) Wong, 2021

Online Marketing

The **following communication channels are part of online marketing** – Social media, the app store presence and search engine optimization.

Social media is the most important communication channel for MaaS companies. There are many uses for social media, such as recruiting talent, B2B relationship building, interacting with industry experts, or enhancing brand awareness.[1)] For example, *Facebook* and *Instagram* are ideal for building a community of enthusiasts, taking in a brand ambassador role. Additionally, the social media pages are directly linked on how the brand is perceived by the customers.

In addition to social media, traditional online marketing such as **Google advertising** are also important. Furthermore, presence and presentation in the app store is another important aspect.

X

Business Model Comparison

All three business models have some parts in common and differ for others

Business model comparison							
	Customer segments	**Channels**	**Value proposition**	**Key partners**	**Key resources**	**Key activities**	**Revenues & Costs**
Platform model	Different	**Similar**	Different	Different	Different	Different	Different
MaaS model	**Similar**	**Similar**	Different	**Similar**	Different	Different	Different
Ecosystem model	**Similar**	**Similar**	Different	**Similar**	Different	Different	Different

Comment

The table above shows a **comparison of all three identified business models**. The analyzed parts of the respective business models faced an evaluation and were either categorized as similar or different.

As expected, across these categories, the **MaaS model and the ecosystem model show some similarities**. This is reasoned by the facts that ecosystem model companies incorporate the MaaS model and lay at the end of the supply-chain.

6

RECOMMENDATIONS

BUSINESS MODEL INNOVATION

Impact on Revenue

Revenue impacts are estimated based on several assumptions and benchmarking figures to simplify the calculation

Sources: 1) Graefe, 2021; 2) Bassig, 2019; 3) Xinhua, 2018; 4) Zomato, 2018

APP ADVERTISMENT	
Number of gastronomy	11.130
% of gastronomy using the service	10%
Number of gastronomy using the service	1.113
Approximated TripAdvisor costs	1.967
Yearly revenue by advertisement	**2.189.649**

TOURIST SHARING	
Number of tourists[3]	4.500.000
% of tourists using the Service	35%
Number of Tourists using the service	1.575.000
Approximately km to explore Lisbon	20
Average Speed (in km/h)	15
Duration (in minutes)	80
Average Costs per minute	0,2
Cost per ride	16
Yearly revenue by mobility	**25.200.000**
Total revenue increase	**27.389.649**

DISTRIBUTION GERMANY		
Restaurants	70.600	56,98%
Clubs + Bars	4.500	3,63%
Cafés	11.800	9,52%
Snack Bar	37.000	29,86%
Total	123.900	

DISTRIBUTION LISBON		
Restaurants[4]	6.342	56,98%
Clubs + Bars	404	3,63%
Cafés	1.060	9,52%
Snack Bar	3.324	29,86%
Total	11.130	

App advertisement assumptions

- Distribution of German gastronomy also applies to Lisbon[1]
- 10% of experience providers are making use of our advertisement service
- The 10% making use of the advertisements service pay 1.967€ per year – a benchmarked figure with TripAdvisor advertisement costs[2]
- Other experience providers next to gastronomy neglected

Tourist sharing assumptions

- 35% of Lisbon's tourist will use the new city tour
- 20 km needed to explore Lisbon city – compared to bus tours and free walking tours
- Average rider speed of 15 km/h
- B2B tourist sharing franchise model and spill over effects, leading to more rides and effects of new unlocking fee structure neglected

Impact on Costs

Cost impacts are estimated based on several assumptions and benchmarking figures to simplify the calculation

Notes: 1) one of the largest micro-.vehicle suppliers of the industry | Sources: 2) Alibaba.com, 2021; 3) Carey, 2020; 4) Alibaba.com, 2021; 5) SPD Load, 2021; 6) Rowe, 2021

VEHICLE LIFESPAN	
Okai wholesale price[2]	478
Life expectancy (in years)	1
Increased life expectancy	100%
New life expectancy (in years)	2
Depreciation before	478
Depreciation after	239
Number of vehicles[3]	12.000
Depreciation savings	**2.868.000**
INTIAL CAPEX	
App development	300.000
Tourism Expert	40.000
Docking Stations acquisition per unit	200
Number of docking stations needed	85
Docking Stations acquisition total	17.000
Docking Station implementation costs	40.000
INTIAL CAPEX	**397.000**
FLEET MANAGER COSTS	
Fleet manager cost per vehicle	370
Vehicles per fleet manager	10
Fleet managers needed in Lisbon	1200
Cost of fleet managers	446.400,00
Reduced need of fleet managers	50,00%
Fleet manager savings	**223.200**
Total costs decrease	**2.694.200**

Vehicle depreciation assumptions

- Okai[1] e-scooters benchmarked on Alibaba
- Vehicle lifespan one year – average of many sources
- Through docking stations vehicle lifespan improved by 75%

Initial CAPEX assumptions

- Dockings stations acquisition and implementation costs benchmarked with e-bike docking station[4]
- App development considered complex[5]
- Number of docking stations estimated over the number of tourists and their need for charging

Fleet manager costs assumptions

- Cost of fleet manager estimated over the cost per vehicle and the number of vehicles[6]
- 50% less need of fleet managers with the implementation of docking stations

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