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Selecting a Carshare Technology Vendor

A COMPARISON REPORT OF THE TOP CARSHARING TECHVENDORS

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"This is the beginning, and dawn of a new era of transportation."

SHERVIN PISHEVAR

Introduction

Although the concept of carsharing has existed for more than three decades, entering today's shared mobility market can be daunting. It's crucial that you find the right technology provider. Not only must you choose the telematics hardware and carsharing software that meets your organization's current needs, the provider of the technology must be innovative enough to stay in tune with market trends.

Once again, we are pleased to bring you our analysis of some of the top techvendors in the carsharing sector. We approached this analysis from an expertise in designing, launching, and operating shared mobility services. Our core strength is our dedication to providing customer-centric operational excellence that ensures sustainable growth for our partners.

This year's report examines how 6 of the top technology carsharing software vendors support their customers. The vendors included in our report are Ecomobix, GoTo, Invers, Omoove, Ridecell, and Vulog.

We've added two new providers this year: Ecomobix and GoTo. Ecomobix gained their foothold in carsharing by providing refueling and relocation management services as Ecoservice. After realizing that they had specialized technology that other techvendors didn't with the artificial intelligence fleet management solution, they decided to

commit to offering full-service, hardware and software solutions. Relatively new to the marketplace, GoTo approaches its technology from a perspective of a carsharing operator. Running the Israel based car2go, GoTo is now a brand that competes on the global stage. They offer hardware and software that support a robust carsharing platform.

Also, two techvendors from last year are not featured in this report: Good Travel Software (GTS) and MonGeo. GTS has targeted their efforts on developing Drop.car, a plugin for existing one-way carshare booking software. And, MonGeo's services are exclusively offered to customers in Russia and Latvia.

As with our first edition, we had each featured techvendor complete an extensive questionnaire that covered pricing, fleet management, trip management, member management, and billing. The questionnaires were completed in April of 2018, and we acknowledge that some technology vendors may have implemented or improved features since then. Also, this report does not claim to be a complete overview of the platform landscape or all of the possible features that each techvendor offers.

Note: This whitepaper is independent work of movmi and has not been endorsed or sponsored by any technology provider.

Carshare Techvendor Comparison Criteria

In Table 1, we present a condensed evaluation of each techvendor's capabilities. We used a 3-point scale to evaluate these capabilities. If a vendor did not have the feature we surveyed for, we gave them zero points. If they had the feature, we gave them one point. If they had the feature and it was implemented well, we gave them two points. If they implemented the feature in an exceptional way, we gave them 3 points. After tallying up all the features in a given criterion, we assigned a 1 to 5-star rating.

The following is an overview of the comparison criteria. These criteria are weighted as follows to reach the Overall Rating presented in Table 1 (next page).

1. PRICING, PROMOTIONS, & DISCOUNTS (15%)

We assessed each techvendor's ability to handle various pricing schemes as well as the extent to which operators have control over pricing, promotions, and discounts.

2. MEMBER MANAGEMENT (15%)

We assessed how easily members can manage personal and corporate accounts, in addition to other tasks such as updating their password, payment methods and drivers license. We also assessed what types of support the techvendors provide to members, and the ability to remotely troubleshoot member issues.

3. FLEET MANAGEMENT (30%)

Here, we assessed key functionalities relating to relocation, supply and demand forecasting, maintenance, and repairs.

4. TRIP MANAGEMENT (30%)

This criterion involves the user experience. We asked questions relating to member registration, what methods can members use to unlock vehicles, vehicle location assistance, damage reporting, and navigation assistance.

5. BILLING & INVOICING (10%)

Among other criteria, we evaluated each techvendor's capability of automating billing and whether their system could calculate applicable tax rates.

Table 1

TECHNOLOGY VENDOR COMPARISON RATINGS (2018)   RATING SYSTEM — Based on 5-star system

	ECOMOBIX	GOZO	INVERS	MOOVE	RIDECELL	vulog
Pricing, promotions & discounts	★★★	★½	★½	★★★★	★★★½	★★★½
Fleet management	★★★½	★½	★★	★½	★★	★★★
Trip management	★★	★★½	★★	★★★½	★★★	★★½
Billing & payment	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★
Member management	★★★★	★★★★	★★★★	★★★★	★★★★	★★★½
Overall	★★★	★★½	★★½	★★★	★★★	★★★

Three key observations can be made from our findings:

Pricing and member account management capabilities are now standard.

All carshare operators are in control of their pricing schemes and can customize pricing plans to their needs. Members no longer have to undergo cumbersome steps to update their payment card, password, and/or driver's licenses as in previous years. All these fields can easily be modified in the app.

> There is a new method to help solve the relocation problem with Ecomobix's algorithm and cost benefit analysis.

Vendors such as Ridecell and Vulog try to help solve the relocation problem with hot/cold mapping and task prioritization. Ecomobix offers this as well but took it a step further with their cost benefit analysis that is driven by their algorithms.

Ease of User Journey has room for improvement, most notably with wayfinding.

All technology vendors adequately support the member experience. However, movmi sees opportunities to elevate that experience. Currently, there's room for improving the wayfinding experience by doing more to help members find the vehicle, get to their destination, or navigate to an available parking location.

Carshare Techvendor Comparison

When selecting a mobility techvendor, it's important to know which features you need and which features the vendor offers. The goal of our comparison is to highlight the level of each vendor's capabilities relative to each other.

Listed below are two tables providing a high level overview of each of the tech vendors. Collectively, the tech vendors offices are located around the world. All techvendors except for Vulog are hardware agnostic (Vulog requires you to purchase their hardware and software). While all techvendors offer various shared mobility services (e.g. carsharing, scootersharing, peer-to-peer and ridehailing platforms), Ridecell is the only provider that currently allows clients operate a carsharing and ride-hailing fleet on the same instance.

Table 2

TECHNOLOGY VENDORS OVERVIEW (SOFTWARE)

ECOMOBIX	GOZO	INVERS	MOOVE	RIDECELL	vulog
Founded: 2017	Founded: 2017	Founded: 1993	Founded: 2002	Founded: 2009	Founded: 2006
HQ: Vancouver, Canada	HQ: Tel Aviv, Israel	HQ: Siegen, Germany	HQ: Rome, Italy	HQ: San Francisco, USA	HQ: Paris, France
Offices in: India, Australia, and Canada	Offices in: Israel	Offices in: Germany and Canada	Offices in: France, Spain, UK, Germany and USA	Offices in: Australia, France, Germany, Japan and USA	Offices in: Canada and France
Part of the Eco-service Group, currently in their A financing Round	Investors: Undisclosed	Investors: Private	Investors: Octo	Investors: BMW, Square, Khosla, Ventures	Investors: ETF Partners, Frog, Capital Eco-technologies

Table 3

TECHNOLOGY VENDORS OVERVIEW (SOFTWARE)

	ECOMOBIX	GOZO	INVERS	OMOOVE	RIDECELL	vulog
Hardware	✗	✓	✓	✓	✗	✓
Hardware agnostic	✓	✓	✓	✓	✓	✓
Software	✓	✓	✓	✓	✓	✓
Ideal carshare	**Free-floating or station-based**	**Free-floating or station-based**	**Free-floatin or sta-tion-based**	**Free-floating or sta-tion-based**	**Free-floating**	**Free-floating**
Multi-service offering	**Carsharing, ridehailing**	**Carsharing and P2P**	**Carsharing and scooter-sharing**	**Carsharing, scooter-shar-ing, P2P and ridehailing***	**Carsharing, ridehailing***	**Carsharing, ridehailing**

* Client can operate carsharing & ridehailing in the same backend.
For Omoove, clients will use their Sharemine platform.

The following is a detailed comparison of the selected techvendors with regards to the criteria outlined in Chapter 1.

1. PRICING, PROMOTIONS, & DISCOUNTS

Due to the increase in size of operators and growing competition in many markets, it is imperative for operators to be able to control their pricing schemes promotions, and discounts. Station-based pricing works great for hourly and day trips. And, it makes sense that free-floating pricing is based on a per-minute rate. However, the market is more complex than those two standard pricing schemes. Corporate memberships are becoming increasingly popular, various types of subscription packages are being offered and more complex types of promotions and discounts are being experimented with.

Pricing set by membership group is now a necessity. It's reasonable for a corporation that provides its employees with a carsharing service to expect discounts or rates that are lower than individual member rates. Similarly, operators may decide to offer different pricing schemes based on the size and type of vehicle. Each of the selected techvendors offer a solution for these pricing options.

Another issue is dynamic pricing. While not a standard feature, Omoove's clients can ask for a custom algorithm for dynamic pricing. The dynamic pricing algorithms can be tailored by taking into account factors such as the vehicle model, time of the day, and rental duration. That said, dynamic pricing as a whole still remains unclear as to how this technology will be implemented. Options include discounts for picking up or dropping off a car at a specific location, and pricing based on supply and demand.

2. FLEET MANAGEMENT

Ecomobix is the frontrunner in this category. That's not surprising. Their carsharing operating system is an outgrowth of their well-established Ecoservice brand. Ecoservice is an in-field mobility vendor that provides operators with fleet services that include cleaning, refueling, and relocation.

To enhance relocation efforts, Ecomobix employs a unique algorithm that performs a cost/benefit analysis. For example, if the intention is to refuel a vehicle, the technology might show that there is a $20 cost benefit to doing so. Ecomobix,

Vulog and Invers offer task prioritization. However, Ecomobix handles task distribution exceptionally well compared to the status quo. Typically, if a car needs to be serviced (such as refueling or relocating) the Fleet Manager Operator has to pass the ticket onto a Fleet Manager Third Party Operator (such as Ecoservice) who then distributes it to a fleet technician. With Ecomobix, the middle man is removed, where the fleet manager doesn't need to receive a ticket, and instead, the ticket moves from member services directly to the fleet technician.

3. TRIP MANAGEMENT

As expected, every vendor allows users to register via an app on their mobile phone. However, GoTo and Invers are the only vendors that do not have the APIs to support third-party integration for validating applicants driver's licenses. Their systems require manual validation.

The ability to book recurring reservations is a valuable benefit for highly active users who use carsharing services on a consistent basis, typically for longer trips. They could be commuters or people who routinely run errands on weekends. Only Invers offers this capability. Perhaps this is because Vulog, Ridecell, Omoove, and Ecomobix primarily focus on serving members that use the free-floating model

while Invers specializes in the station-based model.

When it comes to navigation, most vendors' platforms can integrate with OEM embedded systems. This capability allows members to use the vendor's mobile app along with the car's dashboard display to navigate their route. There is a trend developing in this area and you can find more details under Trend 2 in the next chapter.

Additionally, it's becoming a standard to allow members to upload images to report damage. Invers is the only provider on our list to not offer this capability.

4. MEMBER MANAGEMENT

Each of the techvendors we surveyed have excellent member management capabilities. Among other things, they all offer technology that allows the disconnection of members from the server. This is helpful when a member cannot end their trip on their own and require assistance from Member Services, perhaps because of issues with the mobile app or they can't connect to the network due a low wireless signal.

Also, each techvendor on our list allows members to update their credit card, driver's license, and password through the mobile app. Many other vendors don't offer this functionality. Instead, members must call member service to get their information updated. This is a major inconvenience, especially if the member needs to make a trip right away.

One standout in this area is GoTo.

> [GoTo] has a unique feature that enables members to manage both personal and corporate accounts with one login ID and password.

While making a reservation, the member will see a pop-up asking them which account they would like to pay with. Vulog has a similar function. Its interface lets the member easily toggle between personal and corporate accounts.

5. BILLING & INVOICING

In the areas of billing and invoicing, the surveyed techvendors have matching capabilities. They can all calculate applicable tax rates, send invoices automatically, and integrate with third-party payment gateways such as Stripe or Gestpay.

While the actual third-party payment gateway differs from vendor to vendor, some allow the use of APIs that allow the connection to gateways that are not the vendor's standard provider.

"Carsharing technology vendors are critical in merging the physical world with the digital world."

ASHLEY CHO, MOVMI SHARED TRANSPORTATION SERVICES
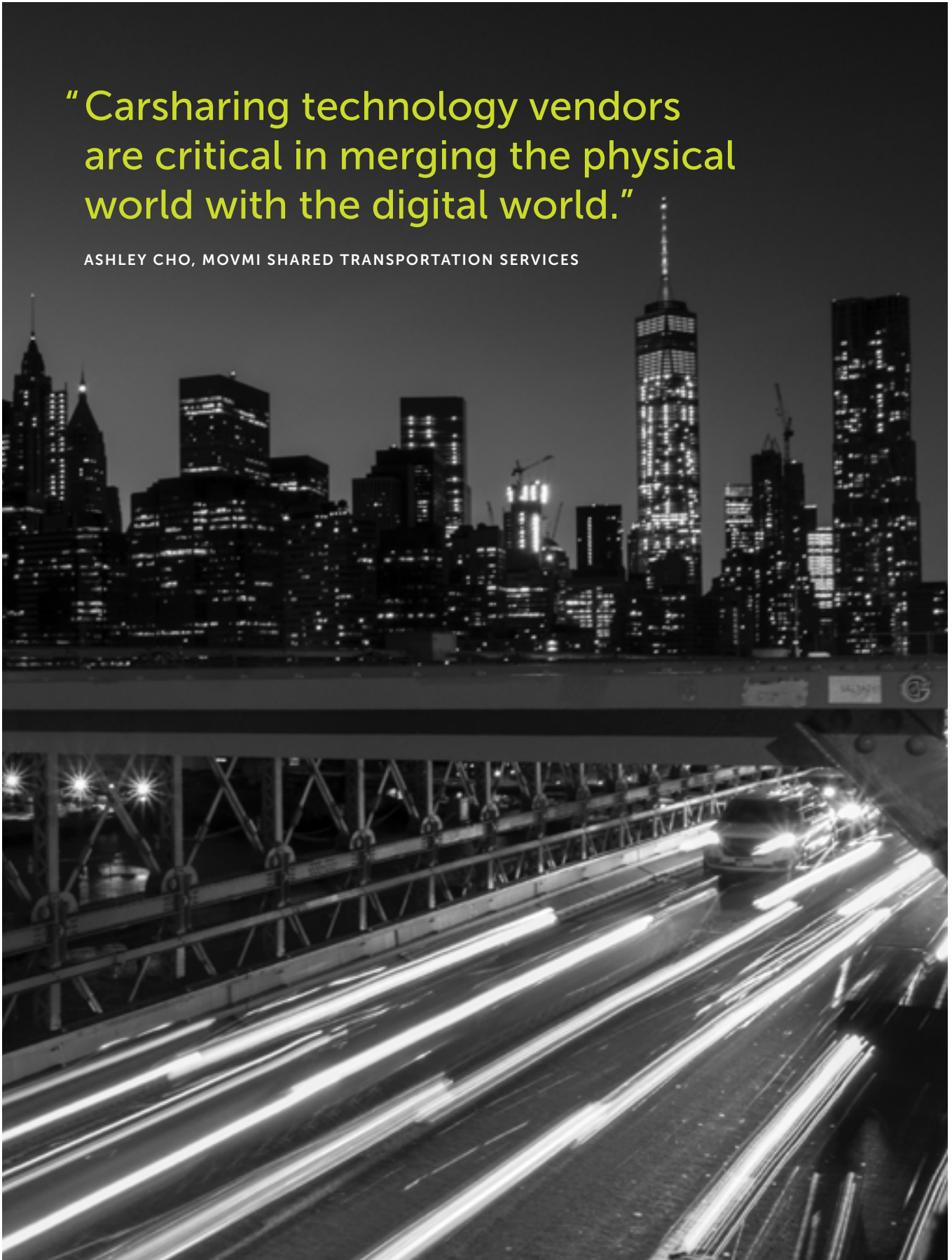
Tomorrow's Trends

The integration of emerging technologies will drive market growth in the carsharing sector. These technologies will bring with them enhanced service quality, greater member satisfaction, and welcomed benefits for carsharing providers.

1   Chatbots

A rapidly increasing number of people are adopting in-home virtual assistants. And, carsharing operators are taking notice. Techvendors aren't interested in creating their own voice-recognition systems. Instead, they're looking for creative ways to join their services with the virtual assistants people already use every day.

Although they aren't featured in this report, Evo Car Share, technology powered by Vulog, and car2go are leading the pack when it comes to leveraging Amazon Alexa. Members of those services can now reserve a car by using any Alexa-enabled device. Soon, members will come to expect the ability to manage their reservations through Amazon Alexa, Google Home, or Microsoft's Cortana.

Additionally, chatbots will be integrated into the car's systems with an eye toward improving the member's experience. For instance, if a member is looking for a parking space at the end of their trip, they could simply ask the chatbot "where do I park?" and receive an instant answer instead of using their navigation system to try and locate a parking space. Among the many benefits of deploying a chatbot is that a member will not need to pick up their mobile phone to seek assistance. This improves safety by eliminating distracted driving. And, being able to talk "hands free" with a chatbot makes it unnecessary for a member to pull to the side of the road, take out their mobile phone, and call member service all while paying for minutes while their car sits idle.

2   Leveraging Telematics

Vendors are beginning to use in-car telematics that monitor driver behavior in more sophisticated ways. The foundation of telematics reporting has been set, now operators are discovering creative ways to use the data.

One valuable use involves insurance. The idea is that carsharing operators will be able to negotiate lower premiums by showing insurance companies that they have safe members, not only at point of registration but throughout.

Operators may also be able to demonstrate their ability to use telematics to identify and discontinue the membership of drivers who pose an unacceptable risk.

Another use of telematics involves pricing based on a member's driving behavior. If a member's driving reaches a certain positive threshold, they could be eligible for a cheaper rate or free trips. Less safe drivers may have to pay higher rates.

3 Navigation is Best Integrated, not Created

Techvendors are not navigation experts. Still, getting members to their destination is an important component of carsharing services.

> **movmi compiled a User Experience Benchmark study early in 2018 and found that most members actually prefer to use apps on their phone instead of learning the onboard car navigation system.**

So instead of developing navigation technology, techvendors will find ways to work with leaders in the navigation space, such as Android Auto for Android devices and CarPlay for iOS devices.

The idea is that, once in the car, members can use the carsharing app on their mobile phones to help with navigation. They can say, "Hey Google, take me to the nearest gas station" and the car's dashboard screen running Android Auto will provide directions. As we pointed out last year, techvendors are using APIs to allow greater integration with these technologies.

4 Entrance of Licensed Aftermarket Providers

Licensed aftermarket providers are keeping up with the trends we've discussed, especially Trend 5. Which means they focus mainly on telematics and hardware improvements that assist with fleet management. As an example, Bosch is working toward creating a "truly integrated driving experience" by using intelligent telematics, big data, and connected services.

They currently have a fleet solution that collects and reports data about the vehicle's condition, the location of the vehicle, driver behavior, and accidents. And, because some form of Bosch technology is used in almost every vehicle in the world, they are well-positioned to challenge, or partner with, carsharing techvendors.

5   End-of-Trip Parking Assistance

movmi's UX Benchmark study found that 50% of all members find it challenging finding a parking spot at the end of their journey. To date, supporting members with this is one of the underdeveloped areas for all vendors. We predict that techvendors will partner with third parties that can provide real-time parking assistance. For instance, by looking at a map on the vendor's mobile app, members will be able to see a green dot indicating that parking is available in that spot or a red dot indicating that parking is not available.

The ability to help members park in designated spaces provides more than a convenience to members, it also helps operators manage their fleet. So on the flip side, techvendors also are integrating better parking alerts for the operators. F.i. if a member has parked in a tow zone, the system can send push notifications to alert the fleet manager. The manager then has time to move the car, thereby avoiding towing expenses.

SpotAngels currently offers this capability for both the end-user (carsharing member) and operational team. They can easily integrate with an existing carsharing platform.

6   Focus on Rebalancing

This is another trend we spotted last year that is gaining momentum. Going forward, techvendors will increase their focus on supporting rebalancing efforts. Some systems will likely allow for dynamic pricing. However, as we discussed in our "4 Concepts to Help Solve the Relocation Problem" report, operators haven't figured out whether dynamic drop-off pricing or dynamic pick-up pricing will be a viable rebalancing solution.

Other systems may focus on delivering improved data analytics and reporting. With better tools, perhaps fueled by AI, operators will have a greater ability to identify a mismatch in supply and demand.

Conclusion

Carsharing has come a long way since the 1980s. The evolving technology has made it more convenient for members to use the services. From registration, to renting, to payment, all the basic needs to make the service work have been met.

Now, the sector is maturing. We're entering a time when techvendors are looking for ways to make the user experience extraordinary while at the same time improving operations for safety and cost savings . Based on our interviews, it's clear that they are making rapid progress.

Remember that not all carsharing techvendors offer the hardware and software features your organization or the regulatory framework in your market may require.

> Need help finding a carsharing techvendor? Email info@movmi.net and we'll help you find the right one

About movmi

movmi is a global boutique agency specialized in Shared Mobility Design: we provide people additional options for their transportation needs: whether that's carsharing, bike sharing or ride-hailing.

We use our 8+ years of experience in shared mobility to help OEMs, dealerships, and startups translate their vision into a

workable business model. Our recommendations are based off evidence and hands-on-experience - not theory based. We offer clients market research services to validate ideas, offer financial models to estimate capital and operating costs and provide a complete operational playbook so that you can get your operations on the road fast.

Acknowledgements

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Thanks to:

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Creating the Next Generation of Shared Mobility