

HireGo

Decentralised Shared Mobility Platform

In a rapidly-decentralising world there is a strong motivation to upset incumbent, centralised services and to create user-oriented alternatives. This paper presents a novel solution to shared mobility leveraging Blockchain technology and smart contracts to ensure user security, transparency and accessibility.

White paper

Last Revision: December 2018

Contents

1.0	Executive Summary.....	3
1.1	The Future – Autonomous vehicles	6
2.0	Background - A brief history of car rental.....	7
3.0	Problem overview	8
3.1	High fees	8
3.2	Centralised Data control	8
3.3	Lack of user choice and control	9
4.0	The Solution	9
4.1	Peer to peer – no middle men	9
4.2	User control and ownership of data	10
4.3	Inter-operable mobility.....	10
4.4	Tokenisation.....	10
4.5	Decentralised social proof insurance	11
5.0	Product and Car sharing models.....	12
6.0	Application	13
7.0	Product Launch;	15
8.0	Smart Contracts	17
8.1	HGO Token	17
8.2	Vehicle Non-fungible Token.....	18
8.3	Rental Contract	18
8.4	IoT Ready.....	19
9.0	Roadmap.....	19
10.0	Team / Contact.....	20
11.0	Partnerships	20
12.0	dApp Screens	21

1.0 Executive Summary

Over the last century, car ownership has increased exponentially due to various factors such as greater wealth, better infrastructure and technological advancements.

However, the car ownership trend is becoming outdated and has been declining over the last decade. In the US in 2009 the number of people who gave up car ownership was greater than new car owners. Improved public transportation, traffic and pollution issues as well as ownership costs are the main reasons for this new trend.

The last decade in particular has seen significant focus towards more sustainable forms of transportation. The problems of pollution and congestion are causing many cities around the world to in fact ban the use of cars in certain locations¹.

In addition to government shift in policy, we have also seen a shift in public mindset towards the sharing economy.

“The emergence of the Sharing Economy reflects the mega-trend in post-industrial western economies from ownership to service. More and more types of people increasingly value use over ownership as many of the hassles of ownership are overcome.”²

Car Sharing is gaining significant popularity worldwide. The connected shared mobility market is set to be worth \$120 billion in 2022³.

“Free floating carsharing services reached 40,000 cars on the streets serving 5.6 million members in 2017. Free floating carsharing membership is forecasted to reach 14.3 million using roughly 102,000 vehicles by year-end 2022.”⁴

¹ <http://www.businessinsider.com/cities-going-car-free-ban-2017-8?IR=T>

² <https://como.org.uk/shared-mobility/co-mobility-themes/mobility-trends/>

³ https://www.strategyand.pwc.com/uk/home/press_contacts/displays/uk-connected-vehicle-market

⁴ <https://iotbusinessnews.com/2018/04/17/15974-free-floating-carsharing-services-are-gaining-in-popularity/>

“Digital information is the fuel of mobility,” – Gilles Vesco

This statement from car sharing pioneer, Gilles Vesco, is at the essence of our approach to solving the inefficiencies of existing shared mobility solutions. By leveraging the data stored on the Blockchain, securely and transparently, we are increasing the availability and accessibility of shared vehicles.

At HireGo we are using Blockchain technology and smart contracts to; automate the vehicle sharing process; reduce or eliminate transaction fees; give back ownership and monetisation potential of data to the user; increase the accessibility of vehicle sharing for both users and service providers.

Blockchain makes data secure and readily available enabling inter-operable shared mobility. For example, users do not need different user IDs to access various forms of transportation, Car, Scooter, Bicycle or Bus. Blockchain User ID is transportable including user history, review and preferences.

All transactions and bookings are open and transparent allowing wider collaboration and ensuring vehicles are used most efficiently.

Transactions are automated without the need for intermediaries taking a hefty commission. The community settles disputes and users benefit from zero fees. Decentralised peer to peer ‘social proof based’ insurance will provide savings of 50-80%.



HireGo – Decentralised Shared Mobility Platform

Tokenisation of payments and assets creates exciting potential for users to benefit further. The platform will be seamlessly linked to various incentive-based token projects such as data sharing, energy efficiency reward tokens and electric charging commission. These bonuses will make a significant contribution towards users' mobility costs making the platform even more affordable.

1.1 The Future – Autonomous vehicles

Level 5 autonomous vehicles are currently being trialled by companies such as Volvo, VW and Tesla. Industry analysts predict that car ownership will decrease and shared mobility will increase as cars become more autonomous. This is due to the cost savings of shared autonomous vehicles versus vehicle ownership and due to autonomous features such as 'roaming' and 'summoning'.

The impending autonomous revolution will therefore accelerate the transition to shared mobility.

"Car sharing is really the mode that allows us to make the transition to automation," said Adam Cohen of the Transportation Sustainability Research Center at UC Berkeley.⁵

⁵ <https://www.forbes.com/sites/jeffmcmahon/2018/03/18/how-car-sharing-companies-can-save-the-world-from-the-autonomous-vehicle-robot-apocalypse/#349448e04fab>

2.0 Background - A brief history of car rental

The German car rental company Sixt was the first to rent cars in 1902. For most of the time since then the car rental business model has largely remained unchanged. This is known as the 'round-trip' car rental where users book cars at a car rental branch and then return the car usually after a period of time ranging from half a day to a couple of weeks.

Over the last decade we have seen the introduction of peer to peer car hire and sharing where users can hire vehicles from local people. Users are able to hire a wider range of cars and for shorter durations. The peer to peer model has become very popular with 5 million users registered shared by the two most popular platforms, Car 2 Go and Turo.

Traditional car rental companies have realised the need for change and have responded with more flexible hire services of their own such as Enterprise Car Club and Hertz 24/7.

Free floating car sharing is the latest development in car rental where users can hire vehicles on a per mile or hourly basis and then park them within designated regions rather than a defined station. Companies include Drive Now and ZipCar.

3.0 Problem overview

3.1 High fees

With the advent of the sharing economy, there has been a sudden and dramatic rise in the popularity of private rental. The Airbnb and Uber platforms, the two most-cited examples of this economic shift, allow millions of users to lease their property or services to others in exchange for a fee.

Turo is a leading market-leading peer to peer car sharing application that boasts a user base of over 2 million. This platform, not unusually, charges an enormous 25%-35% commission! There is also distinct lack of choice and competition within this arena.

“It’s an interesting move — and highlights that despite the buzz around the ‘sharing economy’ some of the most successful start-ups in the space end up looking a lot like the traditional businesses they are trying to disrupt”⁶

3.2 Centralised Data control

Given the increase in user-control that the sharing economy offers, the lack of decentralisation is surprising: incumbent industry capitalises on data ownership and the monopolisation of its users.

Transactional data is created and stored by the platform and is inaccessible to the users it concerns. This information, invisible as it is to users, may contain sensitive or valuable information and becomes a target for theft.

⁶ <http://uk.businessinsider.com/turo-car-rental-airbnb-sharing-economy-business-model-uk-launch-2016-12>

This data also provides significant monetisation potential. The platforms number one priority is to allow users to enable users to control and therefore be able to monetise their data.

An extra layer of abstraction will present the user with a way of retrieving their data and passing it, securely, to a third party. Data will be encrypted using the receiver's public key.

The abstraction layer will return lists of IPFS hashes to the user, indicating where data they own is stored, and some metadata about what is stored there. This can then be retrieved and shared at will.

“Everything that can be decentralized, will be decentralized.” –

David A. Johnston

3.3 Lack of user choice and control

In addition to the problems of excessive fees and customer data abuse, another problem is lack of user control. Traditional monopolising companies will inevitably restrict user choice and control to maximise their own profits.

4.0 The Solution

4.1 Peer to peer – no middle men

By leveraging the blockchain to create a trustless, decentralised rental platform, HireGo aims to overcome the shortcomings of existing solutions. Using blockchain-based identity solutions ensures that users can manage their own data, granting access as and when they see fit, and provides additional assurances that users of the platform are genuine and trustworthy. The use of smart contracts, contractual code running on the Ethereum network, removes the necessity for a middleman and allows users to conduct trustless rental transactions.

The HireGo peer to peer application will have zero to minimal fees for listing vehicles (up to 10% hire including insurance) compared with up to 35% commission charged by existing centralised companies.

4.2 User control and ownership of data

There have recently been some high profile cases of data misuse for example the Cambridge Analytica scandal and Facebook. HireGo user data is not stored on a centralised server with access only available to a single company. Rather, the data is stored on the decentralised Blockchain and is fully controlled by the user who can grant permission to who he /she pleases and when. This prevents data theft and other misuse.

Users can also monetise their data by selling to third parties.

4.3 Inter-operable mobility

Blockchain based user ID is transportable. This enables a user to access multiple forms of transport with one ID which records his details, history and handles all transactions seamlessly.

4.4 Tokenisation

Users will benefit from being a part of the token economy. In addition to using HGO tokens to hire for vehicle transactions, users will be rewarded for car sharing and even for electric vehicle charging. Users can automatically earn tokens from energy saving token incentive schemes.

Users Blockchain data will be owned and controlled only by the user. This will enable the users to sell their data to third party companies.

Tokens can be converted to any other currency or back to HGO tokens. The user can therefore significantly subsidise their travel by taking advantage of tokenisation.

4.5 Decentralised social proof insurance

Traditional insurance is expensive. Decentralised blockchain enables peer to peer social proof based insurance. Users, by recommending another user for insurance, will be able to earn tokens and benefit from significant insurance savings of up to 80% compared with traditional insurance.

“We strongly believe that decentralized trust will unlock a decentralized future. We are entering the next phase of the internet with many blockchains reshaping traditional economic models to become largely self-regulating. Thus, the need for a centralized institution is becoming redundant. In this aspect, InsurePal challenges the insurance industry of today with a decentralized, self-regulating social proof insurance platform with perhaps the most innovative model of risk selection.”⁷

⁷ https://insurepal.io/InsurePal_whitepaper.pdf

5.0 Product and Car sharing models

Private peer to peer

Users can list their own private vehicles and earn extra income. After all, most private vehicles are unused 90% of the time.

Fleet / community management Platform

Companies or 'power users' can manage entire vehicle fleets. These can be open or closed communities, preferences can be set by the fleet owner.

Corporate car sharing schemes are increasing as well as residential.

The platform will democratise car/scooter rental as the platform will be accessible to any size company.

There are various forms of vehicle rental all which will be customisable within the platform. These include;

Traditional 'round trip' rental; Hire vehicle from dedicated hire room, return at same location.

'Free floating' hire/sharing; Vehicles can be parked or collected from specified regions. Vehicles usually parked on street. Vehicles fitted with keyless access.

Station based vehicle sharing; Vehicles parked in dedicated yards and accessed remotely, no human involvement.

Private Peer to peer rental; User rents out personal vehicle when not in use. Vehicle picked up and returned to/from user home address or custom address.

6.0 Application

HireGo is building a decentralised, peer-to-peer marketplace that allows its users to lease their vehicles in a trustless and secure environment. The marketplace leverages the Ethereum blockchain as both a public ledger for lease transactions, and for conducting the transactions themselves, using a smart contract framework.

The HireGo marketplace provides a directory of vehicles available for hire. Users are able to select an appropriate vehicle, secure it for their desired period and settle the payment, in-app, using the HGO token - an ERC20-compatible cryptocurrency built for the purpose (see HGO Token). Vehicles listed on the marketplace are crowdsourced from HireGo users and can be easily added in-app; additional tools are available for companies or “power-users” making larger numbers of vehicles available.

HireGo has been designed with simplicity and security as a first priority. Payment is made, in advance, and held in an escrow contract on the Ethereum blockchain; in the event of a dispute between users, a trusted party, such as the dedicated HireGo resolutions team, will be able to make the final judgement. Reviews and comments made by users will also be stored on the blockchain, creating an indisputable, trustworthy record of a user’s conduct. These technologies are handled natively by the HireGo application and all technical complexity is hidden from the user.

To provide additional peace-of-mind, the marketplace will also offer various insurance options for users. These insurance packages, provided by a trusted industrial partner, will ensure that vehicle owners are protected from unexpected collision or damage.

As with payment and review, the rental transactions and vehicle listings are conducted via the Ethereum blockchain. The HireGo applications provide a gateway for accessing this data in an intuitive manner and will create and send the necessary transactions, eliminating any potential friction for the user - no knowledge of the blockchain is needed to use the

marketplace. When a user enters into a rental contract the application will interact with the appropriate smart contract on the user's behalf, parsing responses and interacting with the system using a pre-defined and public protocol. Importantly, users retain control of their private keys and, at no time, is this broadcast to HireGo or any third-parties.

There is an intrinsic fee when transacting via the Ethereum blockchain, known as the "gas cost", used to incentivise miners and to secure the network. When using the HireGo applications, any gas costs incurred will be covered automatically, without the user's knowledge. This results in a smooth user experience and removes the need to manage multiple currencies, a drawback in some existing decentralised systems. The slight cost to HireGo will be included in the transaction fees, taken in HGO tokens.

A gateway will be provided for the exchange of fiat to tokens and vice versa, further eliminating friction for users new to cryptocurrency. This will allow profits to be easily withdrawn to a bank account. Deposited currency will be automatically converted to HGO tokens and transferred to the user's wallet, visible as a balance on the marketplace.

Incentive schemes will be employed, via social media and in-app, to reward users for creating helpful content (such as well-written reviews) and for growing the community. It is important that positive use of the marketplace is encouraged and HireGo believes that exceptional users, from those providing consistently great feedback to those receiving it, should be encouraged. HireGo will employ various gamification techniques, including virtual trophies, and will provide financial incentives to foster a pleasant and professional community.

7.0 Product Launch;

Phase 1; Demo dApp

Launch date; April 2018

Demographics; Product testers/investors

Description; Provide working proof of concept

Features;

List and select vehicles

Data stored on Rinkeby testnet.

Phase 2; Beta version (public)

Launch date; February 2019

Demographics; Registered testers from existing community up to 500-1000

Description; Initially only peer to peer hire features will be available

Features;

Token utility

User login using wallet

Vehicle listing / booking

Automatic entry (alpha version)

User reviews

Phase 3; Public beta version advanced

Launch date; June 2019

Demographics; Registered testers from existing community between 1000-2000

Description; Incorporate advanced tokenomic features and in-app Insurance option, general update from beta version.

Features;

Gamified wallet review system

Integrated token rewards

Advanced keyless unlocking and starting

Improvements to UI/previous version

Phase 4; First full release public

Launch date; September 2019

Demographics; Public, unlimited, private corporations / partners

Description; Release version including fleet management for wider vehicle sharing such as free floating car sharing. We aim to work with key corporate partners in trialling the app for their private fleets.

Features;

Fully functioning Platform

Beta version fleet management app

Phase 5; Updated Platform with corporate car share features

Launch date; January 2020

Description; By this stage we expect the basic peer to peer platform to be functioning seamlessly and will be focussing on corporate fleet features.

Features;

Release version fleet management platform

API ready for third part dApps

8.0 Smart Contracts

The HireGo marketplace will deploy three smart contracts to the Ethereum network: the HGO token, a Vehicle non-fungible token and a Rental contract. An additional storage contract will be deployed for use in a hub-and-spoke model, ensuring that any updates or bugfixes may be released in a timely manner, without loss of data.

8.1 HGO Token

This is a digital token of cryptocurrency that is used to purchase a good or service. We aim to make HGO the principle mobility token worldwide.

A certain number of tokens will be made available to incentivise good behaviour on the platform. A voting system will also be established where, for examples, disputes are resolved by voters who are holding HGO tokens. This is to aid decentralisation.

Gas costs incurred by transactions made using the HireGo app will be covered, ensuring that users do not need an Ether (ETH) balance to place transactions. There will be protection mechanisms in place to ensure bad-actors cannot abuse this system. When a transaction is selected the gas cost is transferred to the user's address and, once this has been confirmed, the rental transaction is issued by the application.

The token will be available for purchase on existing cryptocurrency exchanges and may be used as a means of exchange and speculation beyond the HireGo application. HireGo will also provide a fiat-HGO gateway to facilitate the easy exchange from GBP, USD and other national currencies.

8.2 Vehicle Non-fungible Token

Each vehicle listed on the marketplace is represented as an ERC721-compliant token. At any given time, the holder of a Vehicle token will be granted sole access to the corresponding vehicle and, as such, the ownership indicates that a rental transaction has been entered into. The token is returned to the vehicle owner on completion of a rental transaction.

Whenever a new vehicle is added to the marketplace a new token will be minted and transferred to its owner. Initially, new vehicles will be subject to moderation by the HireGo team, however this restriction may be removed in the future to aid decentralisation. The token will contain identifying information in its metadata, linking it with the vehicle it represents. Whenever a vehicle is removed from the marketplace the token will be burnt, ensuring that a one-to-one correspondence between all Vehicle tokens and their marketplace counterpart is maintained; this prevents the fraudulent lease or trade of non-existent vehicles.

The use of a non-fungible token to represent the access to a vehicle creates space for future applications, including the use of smart locks that respond to messages signed by token holders. HireGo aims to leverage blockchain-ready, Internet-of-Things technology when it becomes available and future versions of the marketplace will allow physical access to the vehicles to be governed by ownership of the requisite tokens.

8.3 Rental Contract

Rental transactions are also made via a dedicated smart contract. This contract will act as an escrow and will mediate the transfer of the Vehicle token between the two parties.

When a rental transaction is entered into, the renting user issues a paid transaction to the Rent contract. These funds are held by the contract until the rental period has elapsed and that both users have indicated a successful transaction. This contract also allows a dispute to be flagged by either user and, in the event that a third-party judgment is needed, HireGo can choose to return the funds to the appropriate party. This model also provides the flexibility for specifying additional trusted parties and, if the contracting parties desire, it is possible to exclude HireGo altogether - furthering the trustless and decentralized ethos of the platform.

The Rental Contract also manages the transfer of the vehicle token from the vehicle owner to the renting user, and vice versa, as required. The token will be owned by the renting user during the rental transaction and then returned after its conclusion.

8.4 IoT Ready

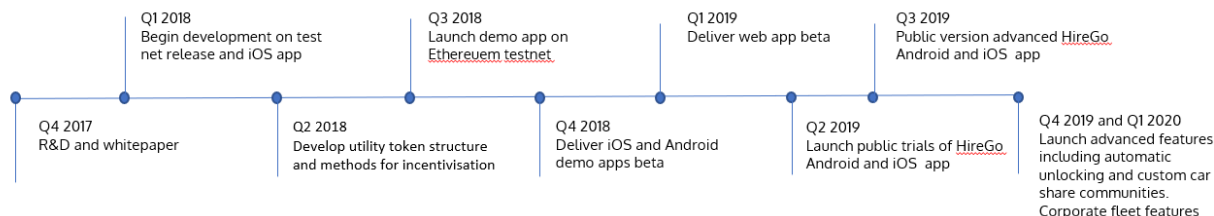
The Internet of Things is the concept of connecting almost any electrical device to the internet and to each other. It is estimated that by 2020 there will be over 26 billion connected devices.⁸

IoT and blockchain (distributed ledger technology) are often associated with one another as both technologies are distributed based.

'By 2019, 20% of all IoT deployments will have basic levels of blockchain services enabled'⁹

HireGo aims to leverage blockchain-ready, Internet-of-Things technology when it becomes available and future versions of the marketplace will allow physical access to the vehicles to be governed by ownership of the requisite tokens

9.0 Roadmap



⁸ <https://www.forbes.com/sites/jacobmorgan/2014/05/13/simple-explanation-internet-things-that-anyone-can-understand/#43ad8cfa1d09>

⁹ <https://www.i-scoop.eu/blockchain-distributed-ledger-technology/blockchain-iot/>

10.0 Team / Contact

See Hirego.io for details of team and Linked In profiles as HireGo is always looking to add to and strengthen its team. Our founder and contact details are below.

Founders: Luqman Hussain and Adil Bashir

Website: www.hirego.io

Email: contact@hirego.io

Twitter: https://twitter.com/Hire_Go

Telegram: <https://t.me/hirego>

11.0 Partnerships

<http://www.mobiqgroup.com/>

<https://www.originprotocol.com/en>

<https://como.org.uk/>

<https://www.autodelen.net/>

12.0 dApp Screens

