



POPULSTAY

COLLECT MOMENTS. NOT THINGS.


A decentralized **home-sharing** platform  
where strangers are friends and experiences are shared.

Guests pay less. Hosts profit more.

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## Abstract

Travelers and property owners in the internet era are living in an inconvenient and expensive hospitality ecosystem.

### 1998 - 2008

Every major Online Travel Agency (OTA) platform claims to offer the lowest booking price for the its accommodation, sometimes even cheaper than the owner's website. A large number of short-term renters are unable to run their business as OTAs are stealing their customers thanks to their huge advertising budgets.

### 2008 - 2018

Home-sharing (HS) platforms are growing exponentially revealing a new world that was never imagined, where guests can directly connect with hosts. Instead of heavy investments needed to build hotels or apartments, homeowners can simply list their spare rooms or secondary properties for short-term rentals. This largely revives the home-sharing economy and brings a new wave hope to the not-so-wealthy homeowners. These platforms are acting as middlemen, charging a recurring commission fee and other supplementary fees in exchange for their listing service and the 'trust' that they facilitate by connecting the host and guest.

OTA and HS platforms will co-exist as we move into the next decade and continue to create value for our users. However, as the competition is becoming more fierce, HS platforms are becoming more and more like OTA platforms. In fact, most OTAs like Ctrip have started acquiring various HS companies. A major issue is that billions of dollars will be spent on marketing and sales to drive traffic, which directly leads to higher operation costs. Companies have to charge higher fees that fall on the traveler and property owner, while the quality of service remains the same.

## Vision

The sharing based economy is the way of the future. It is already disrupting established industries such as hospitality, automotive, retail and consumer goods, media and entertainment. Notable disruptors in this field include Airbnb, Zipcar, Lyft, Kickstarter and more. The market is set to expand 20-fold within the next 10 years, to over 300 Billion USD. In fact, in 2016, Japan's sharing economy was valued at 4.5 billion USD.



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The adoption of the sharing economy will be fuelled by factors such as trust, convenience, affordability and a sense of community. There is an increased faith in community-run platforms and peer-to-peer systems. According to a Nielsen survey, over 90% of consumers across a majority of countries said they make decisions based on recommendations from their friends and family above all other forms of advertising.

While this is a great opportunity, there are still aspects of the sharing economy that need be worked on for it to become mainstream in the coming decade. The main aspects to be managed are:

- 1) Identity
- 2) Peer-to-peer systems
- 3) Reputation profiles

Additionally, disruption in the sharing economy will take place in the following areas: asset management, dispute resolution, self-sustained marketplaces, high transaction and commission costs.

Current industry leaders such as Airbnb battle fraudulent listings and struggle with their dispute resolution systems, limiting the direct value exchange between parties involved in the platform. For the services they render as being the trusted middleman for guests and hosts they charge a high commission fee. Also there are practical issues related to foreign currency exchange, digital card transaction fees and more, for all the stakeholders involved.

Over the past decade, technological ideas around peer-to-peer distributed technologies such as blockchain and Internet of Things (IoT) have promised to deliver the tools that are necessary for solving most of the aforesaid concerns.

Blockchains are secure and tamper-proof distributed ledgers which, when combined with smart contracts, enable transparent governance, provide access control, encode automatic transactional business logic enabling trust between parties involved. By securely validating both guest and host information, blockchains help streamline user experience and increase safety and trust in the sharing economy for the hospitality industry. Owing to their tamper-proof nature, they allow every user in the system to audit the chain's operation. Using blockchains is much more

inexpensive and increases safety to all stakeholders in the system by removing intermediaries in the system enabling true peer to peer interactions.

Next, thanks to advancements in smart objects and options for such technologies to be connected in a network, the field of Internet of Things (IoT) has recently boomed. This has opened up new ways in which smart objects (such as door locks) to be connected. These door locks can now be connected to the marketplace and be remotely managed using the cloud. This also enables easy management and automation by giving the right people access at the right time. Furthermore, by connecting smart locks to smart contracts, it will enable these devices to perform automated transactions such as door opening, enabling reduced management overhead for the owners and hassle free experience for the guests driving productivity and reducing costs.

## Populstay

Populstay is a decentralized home-sharing platform. We are creating such an IoT driven ecosystem for the sharing economy. Our focus in the initial phase will be on the hospitality field, we are solving the problem of peer-to-peer property management. The platform leverages cutting-edge technologies from distributed and decentralized computing, blockchain, IoT and network security. Providing an efficient and automated solution where value providers homeowners and consumers will be able to exchange value directly, efficiently and seamlessly. Consequently, Populstay can afford the same level of quality at a lower rate while still requiring strict Know Your Property (KYP) and Know Your Customer (KYC) before being accepted to the platform.

Populstay offers the following advantages over traditional home-sharing platforms:

- 1) Empower users by letting the community regulate itself in a transparent manner
- 2) Lower fees
  - a) Low platform commission booking fees
  - b) No transaction fees to financial institutions (such as credit card companies, and banks if paid with crypto)
  - c) No fees incurred on cross-currency transactions (foreign transaction fee, currency exchange costs etc.)
- 3) Trust provided by the blockchain

- 4) State-of-the-art security features, no one can alter the system or data easily
- 5) Easy arbitration and dispute resolution in case of issues between guest and host
- 6) One stop solution for guests and host

Populstay provides a hassle-free end-to-end service to seamlessly manage a property. This leads to a superior experience with an affordable price for the guest and maximal profit at minimal cost for the owner.

This project is one of the eight projects selected by [Blockchain Business Camp Tokyo](#)



## Business Model

### Centralized

Existing home sharing booking platforms allow owners to publish a listing online for free while charging a commission from the owner and guest for every transaction on the platform. They also pressure guests to book through their platform for protection from any incidents that may happen. This 'issuance' fee varies from 13% to 20%.

Existing OTA platforms are spending a large amount of their earned revenue on marketing, sales, and brand advertising. Driving traffic and demand to the platform and leading to confirmed bookings for the hotel and property owners. The commission fees to hotels/property owners varies from 10% to 25% depending on the platform.

### Decentralized

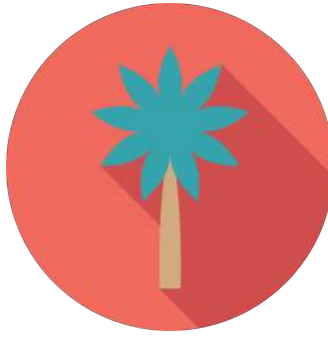
Populstay is the next generation travel platform with complete property management services using blockchain technology. We aim to rebuild the value exchange system between the owner and guest restructuring how properties should be managed using AI, IoT, and blockchain technology. This leads to higher profit margins and lower operation costs for owners, while ensuring a better and cheaper experience for guests.

Populstay keeps only a 1.5% booking fee per transaction. For owners to list their property on our platform, they must meet certain listing criteria and fulfill legal norms for short-term rental by our strict KYP (Know Your Property).

Populstay offers activities via the integration of third-party services in a decentralized way. Listed are some of the examples:



Transportation



Home Repair



Cleaning &amp; Washing



Photo Shooting



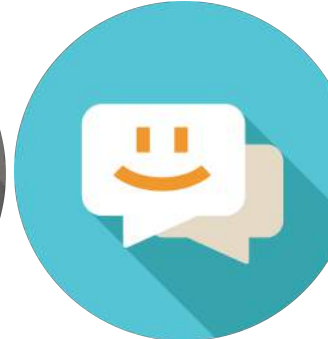
Emergency Support



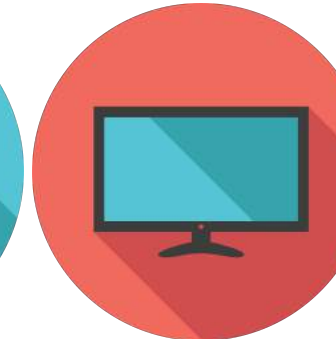
Smart IoT Gadgets



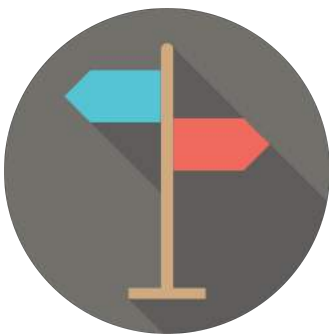
Smart Pricing



AI ChatBot



Interior Design



Local Guide

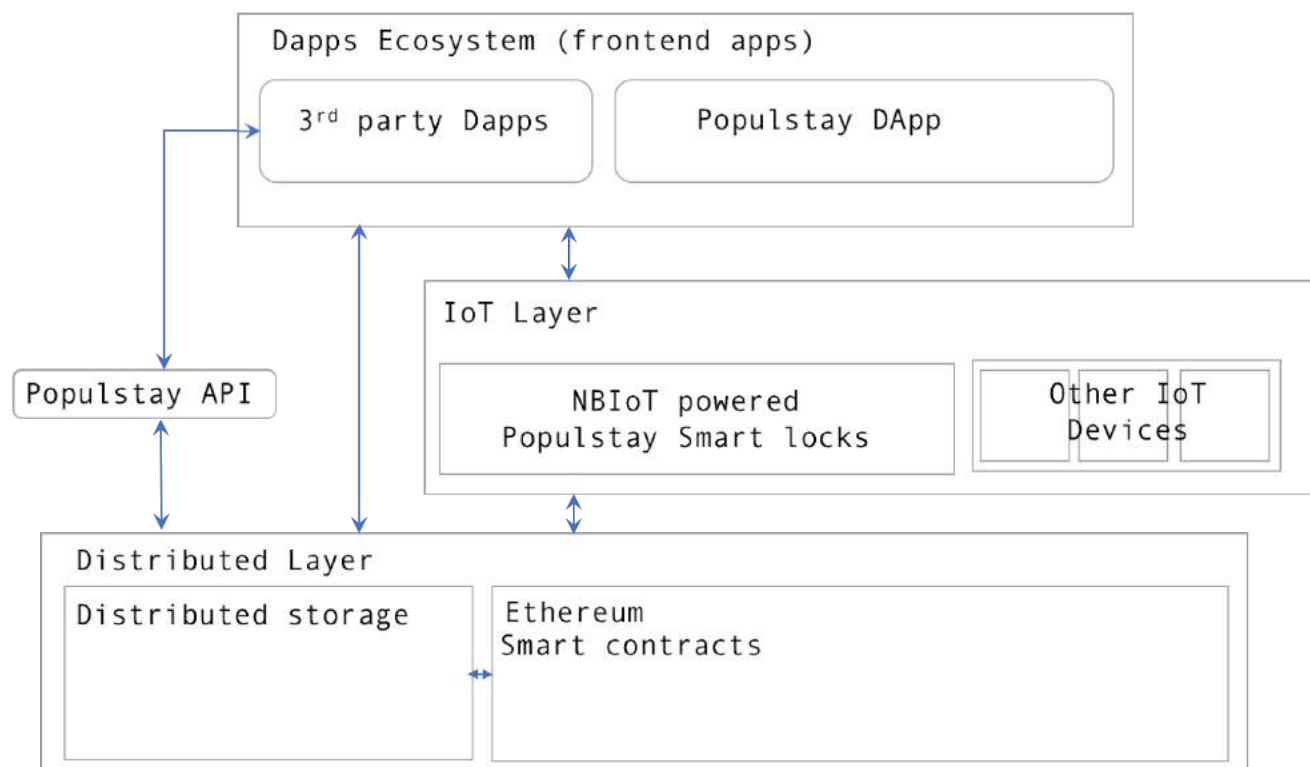


Marketing &amp; Branding



Restaurants

## Technical Overview



### Populstay dApp

Our community will be able to access listings and go through the entire booking experience from their Android or iOS phones. The user experience will be similar to other high quality apps in the market, except our back-end which will be powered by the blockchain. In-app notifications will be directly received, without the need of a third party.

### Blockchain and smart contracts

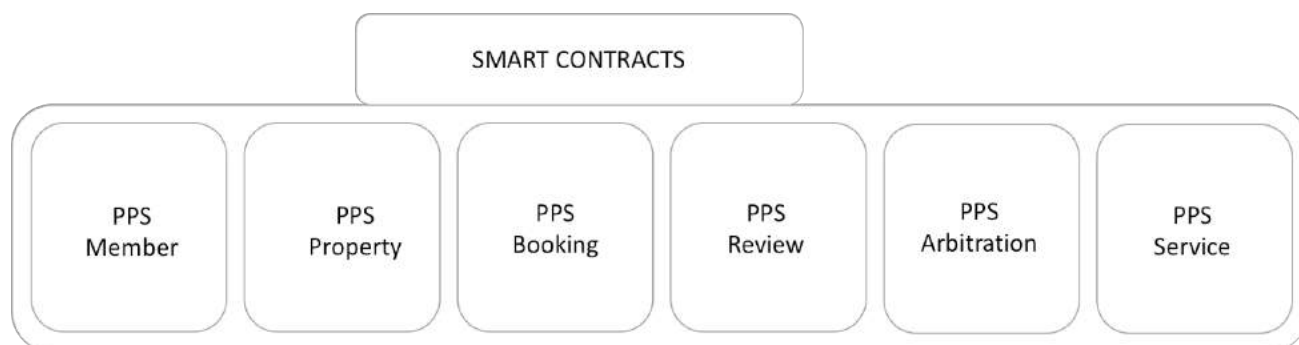
We'll be using a network of computers that form a platform for building decentralized applications of any kind, through the implementation of a set of immutable rules (smart contracts). These contracts will be automatically created, and used to manage agreements between:

- 1) Populstay & host → Rental listing (price, location, amenities, hashes of media content, profile)
- 2) Guest & host → Accommodation (dates, rating, guest profile, general information)



- 3) Host & external providers → Cleaning, photography, car-sharing, food delivery, tour guides and more.

The immutability of the blockchain allows us to not have to trust a centralized third party for our services.



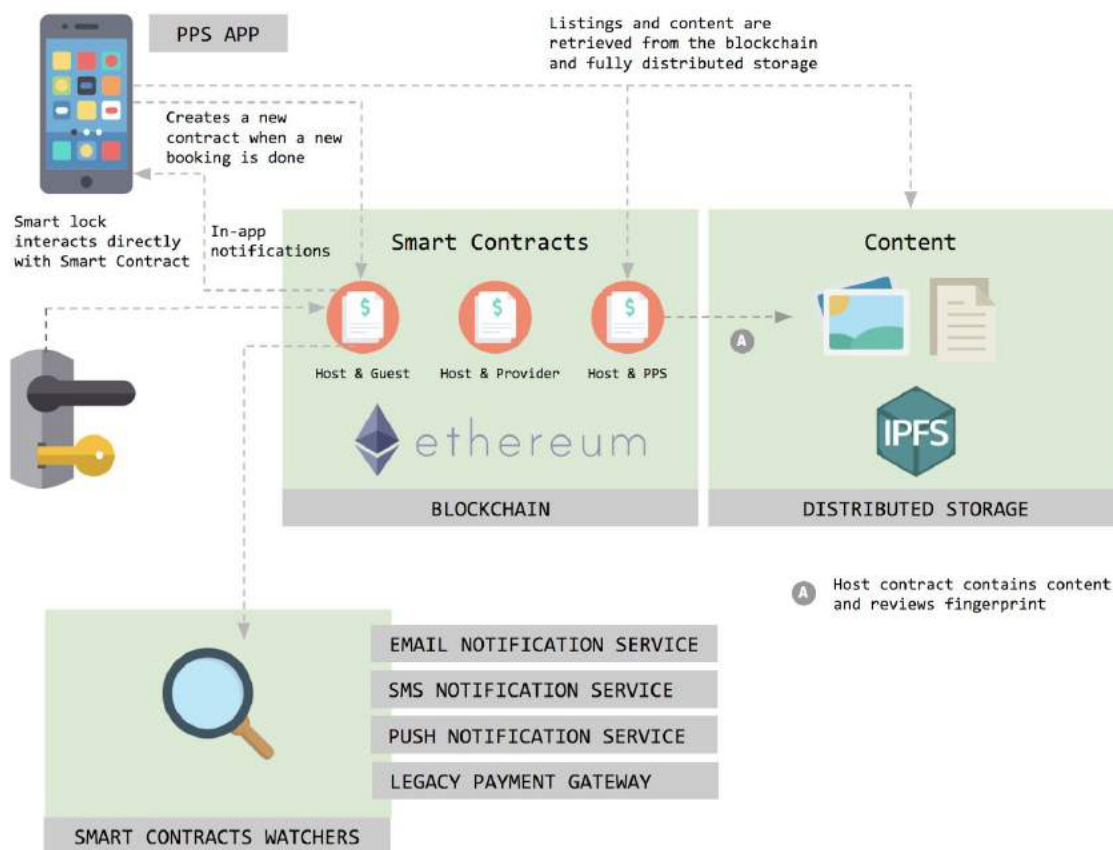
All the smart contracts are implemented on the Ethereum network and are fully compatible with the ERC20 standard. However, Populstay has the plan to build PopulChain after its prototyping phase to improve the user experience and handle the weaknesses of Ethereum.

## Distributed Storage

To maximize efficiency, we will be adding an additional off-chain layer where all non-transactional information (pictures, descriptions, dates) will be stored securely in AWS S3. To preserve integrity, hashes of this information will be stored on the blockchain.

## Smart Contract Watchers and Web Server

We'll be integrating external service providers such as email, payment and SMS gateways. A centralized server will be established by Populstay to monitor the blockchain's activity and then report to these providers. It'll be a bridge between the decentralized and centralized model that we currently live in.



## Components overview

PPS is composed of the following main core components:

- A series of Ethereum smart contracts which will manage agreements between the host and Populstay, the host and the guest and the host with the external service providers
- A distributed file system storage where all the content of the listing will be stored and accessible
- A smart contract watch server, which is used to integrate with external non-distributed services such as SMS notifications, emails or external payment gateways
- A web server which will allow users to access the rental services provided on the blockchain

Communication with these core components with external applications:

- The mobile app which allows guests to make bookings, browse listings and purchase management services.
- A smart door lock which is directly connected to the blockchain and ensures secure and seamless user access to the rental unit



## IoT Integration

An important aspect of the Populstay platform is its ability to integrate with different kinds of smart devices seamlessly into the ecosystem. In our first iteration, we will focus on Narrow Band IoT powered smart locks. These smart locks will be autonomous in that they will be a part of the blockchain, they will be able to take bookings, accept payments, allow user access, all on their own with minimal maintenance.

One of our key strengths is that we will be providing our own brand of smart locks which will be configured and customized specifically for the Populstay ecosystem. We already have working prototypes of these locks. In addition, to allow other smart locks/smart devices to talk to our smart contracts and blockchain directly, we will expose API endpoints.

The main advantage of an IoT integrated smart lock + blockchain solution is that we can automatically schedule payouts to the host as soon as the guest check in (uses the smart door lock) using PPS tokens. In addition, for multi day bookings after every day, the smart contract will

be configured in such a way that it pays out to the host the amount on a daily basis (i.e pay as soon as you use model). This way the host need not wait for the whole stay period of the guest to get paid. This is a big advantage since it completely removed the need for third party centralized institutions such as banks for payment and also removes the need for large clearance periods and transaction charges associated with these services.

Initially, the smart lock is registered to the Populstay User's ID/ address with the user being able to perform actions on the device as defined in the Populstay DApp.

As soon as a host (who buys our Populstay locks) gets a new smart lock, he will navigate to the configuration settings and set up his public address there by establishing the link between the lock and user by triggering a smart contract which establishes ownership.

The owner can now access rights to different users (typically hosts) (depending on the conditions agreed upon). Every time a new user is given access to the device the transactions are sent to the smart contracts which update the blockchain.

Every user who has been authorized to access the lock (during the period of stay) can trigger commands to open the door lock using the Dapp. Once the trigger is sent, a message is sent via the Populstay blockchain to the smart lock. The smart lock now verifies the sender information as in the smart contract and can automatically open the door. In addition, one can also envision a PIN which will be generated once the smart lock verifies the sender information, this PIN will be needed to be entered into the smart lock display panel to open the property. For these messages, the whisper protocol proposed in the ethereum protocol seems to be the best fit.

One of the key aspects of our design is that the IoT devices are a part of the blockchain and hence it will be impossible to be hacked. In fact, we will also hash the device's firmware into the blockchain, that way even if there is a malware that alters the firmware, the owner will be notified of it.

A typical workflow using our systems while highlighting our strengths are the following:

### **Hosts:**

- 1) The smart lock is integrated into the Populstay booking app and is associated with a listing. So, when there is a confirmed booking from the guest, according to the smart contract, the access pin code to the listings will be generated and sent to the guest at a preferred time.
- 2) In the event that the guests confirmed to extend the stay or cancel the booking, the necessary payment will be handled, and the code expiration date will be extended or expired according to the smart contract without owner's intervention.

- 3) Once the guests check out of the room, according to the smart contract, the necessary cleaning service will be allocated and triggered, a temporary one-time pin code will be sent to the cleaner for accessing the listing.
- 4) In the case that there is a dispute of stolen items or the duration of stay about the booking, the owners can always pull the access records about whom and at what time has access to which listing. This information will be helpful for dispute resolution.

### Guests:

- 1) The guests no longer need to wait for the physical keys to be exchanged during check-in and checkout. This enhances the stay experience.
- 2) The guests have no risks of losing the key which causes dispute during the stay.
- 3) The guests can quickly identify those fake listings where on the surface the dates are open to book, but the NB-IoT locks fail to generate codes due to double booking.
- 4) The guests can share the code to a clear, visiting friends during their stay etc.

## Populstay Smart Locks

NB-IoT technology is advancing at an amazing speed in most countries. It is known as LTE Cat NB1, a Low Power Wide Area (LPWA) technology that works virtually anywhere. It is currently deployed in major regions like China, USA, Europe, South Korea, Hong Kong SAR, and Singapore. It connects devices more directly and efficiently on already established mobile networks and handles small amounts of reasonably infrequent 2-way data, securely and reliably.

The best is, it provides:

- Very low power consumption with very good extended range in buildings
- Underground easy deployment into existing cellular
- Network architecture network security & reliability, and
- Lower component cost

Populstay is prototyping smart door locks using NB-IoT technology and is writing the smart contract into the lock. With the mobile App or web dashboard, the host can manage the property remotely and conveniently. Below are the few use cases on why the owners of Populstay need to purchase the smart lock for their property:

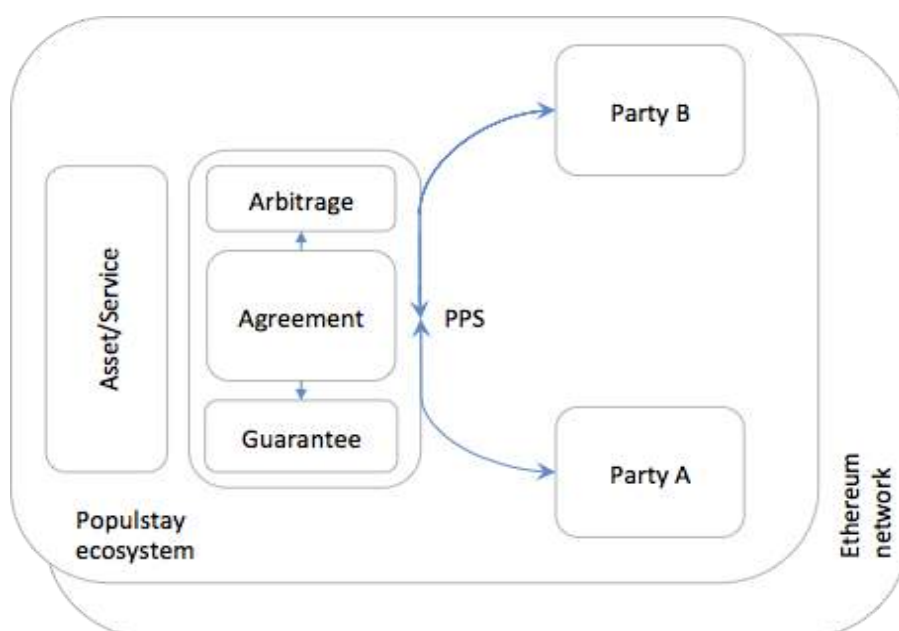
The NB-IoT enabled smart lock will be the first smart device recommended for use in the property management space. Populstay has the plan to R&D and manufactures more innovation relevant to property management such as smart lightening, smart electricity metering powered by NB-IoT when there are needs to optimize the user experience and the operating cost.

## Community

The most important aspect of every company and yet so few seem to acknowledge it. Unlike most companies that keep the profits to themselves, we at Populstay not only understand you but we also distribute half of our profits to our loyal users while providing large discounts for frequent travellers. We care.

Every task you do in our network increases or decreases your reputation (reviews, bookings, verifications, total transaction value, token purchasing, arbitration and more). The more you contribute, the higher your rating becomes while at the same time the more benefits you'll receive (discounts, free tokens & bookings).

We believe that the individuals who have contributed the most to Populstay's growth should be partaking in the decision making process of how the ecosystem is governed. A DAO (Decentralized Autonomous Organization) is elected to resolve disputes, verify listings, filter out malicious users and vote on upcoming laws and regulations.



## Token Economics

PPS tokens are utility tokens which have intrinsic utility value within the Populstay platform and is aligned with the objectives of the home sharing ecosystem. This allows us to make sure our platform is agnostic to a single cryptocurrency/platform enabling us to better manage off/side chain components of the Populstay platform.

Users of Populstay will use the PPS tokens for the following:

- 1) Rewards/Loyalty program
- 2) Users who actively participate in the Arbitration/Guarantor aspects of Populstay will receive PPS Tokens
- 3) Referral programs will be fully driven by PPS Tokens
- 4) Platform services such as deposit, opening a grievance etc
- 5) Payment for listing
- 6) Payment for third party services (such as tour guide, shopping experience, tea session etc)
- 7) Users reward each other using PPS tokens (as a token of appreciation)
- 8) PPS will be a listed cryptocurrency whose value is expected to increase over time (we have plans to list PPS tokens in a couple of exchanges whose value is assumed to appreciate with time and bring value to different stakeholders on the ecosystem)

One of our key areas of innovation with PPS Tokens is our value model whose economics is directly tied to a user's strength in the Populstay network. The strength of a user (either as a host or as a guest or as a 3rd party service provider) is tied with his user ratings.

A user who is active in the community and is

- 1) actively referring and bringing more people into the network
- 2) actively involved in rating and reviewing services of the ecosystem
- 3) part of the grievance redressal aspects of the network

becomes stronger in the network.

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The stronger a user becomes in the network the lesser he has to pay (as PPS Tokens) for using the services of the Populstay ecosystem.

This way we incentivize people who keep the Populstay network strong. There will be a variable pricing model (for charging the various platform related fees).

Our philosophy is that as a user becomes loyal to our network he should be paying close to nothing for using the services of the platform for the platform gains strength due to his presence. In line with this principle, we will tune our pricing models to be directly be dictated by the network properties of a user.

While PPS Tokens, have utility value in the Populstay network and drive the complete ecosystem of Populstay, we will also have provision for the POP Token which will be token driving the reward programs. All transactions with in the Populstay network will be done in PPS tokens. However, depending on the usage of PPS Tokens i.e if the transaction rate is above a threshold, POP Tokens are awarded to users.

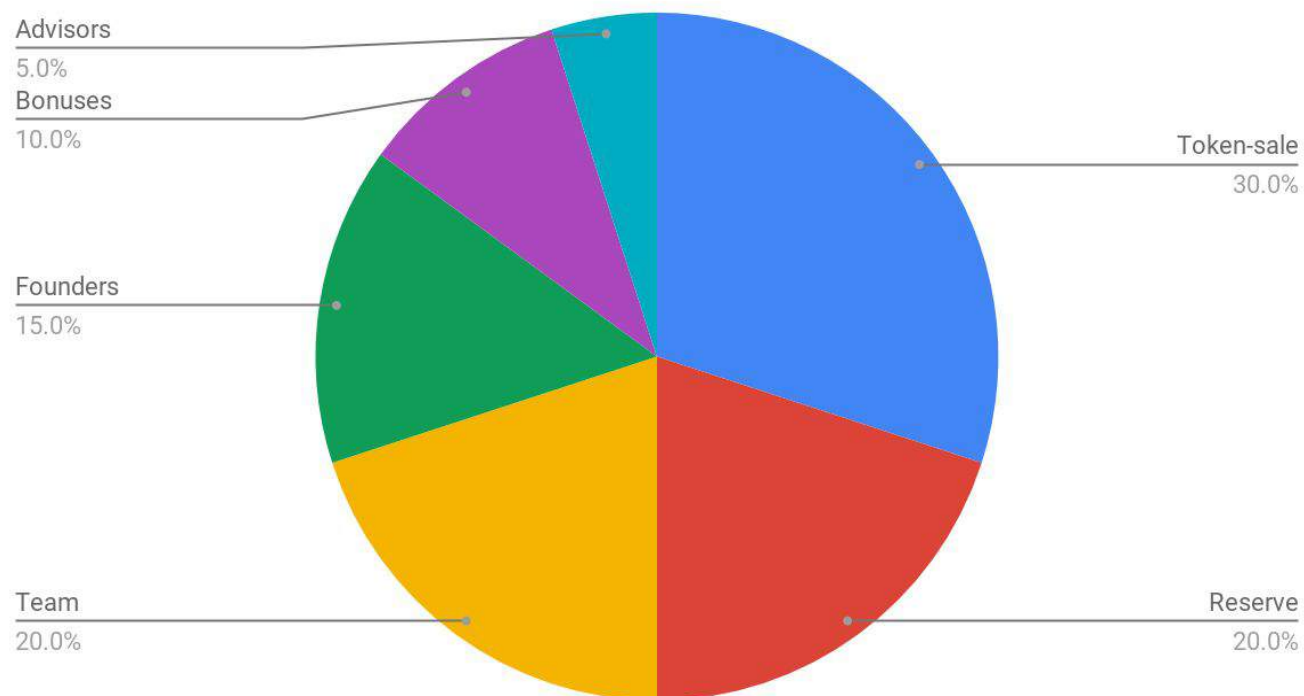
POP Tokens are going to be equivalent to some PPS tokens (this will be adjusted by the community for maximum benefits). As we discussed before, A small about of booking charge will be charged for every transaction in Populstay. From this booking charge a fixed percentage will be set out for paying rewards.

Every time a user's transaction rate in the ecosystem increases beyond a certain threshold, a POP token is assigned to the user. The POP Token can be redeemed to PPS tokens when need be. However, there is a major advantage of holding onto to POP tokens in that, the charge that has been set aside for rewards is distributed to the holders of POP (proportional to the amount of POP tokens they have). Rewards are only assigned to POP holders and not PPS holders. The idea is that POP is mark of being active and driving the community and hence such users will be rewarded with Tokens.

PPS Tokens will be a stable and listed cryptocurrency whose value is expected to increases over time. Finally, If users wants to quit the Populstay ecosystem, he has to stake his PPS Tokens for a community decided exchange rate to convert it to which can be converted to Fiat currency or other cryptocurrencies.



## 5 billion PPS



Team, Founders and Advisors have 2 years vesting period, with a one year cliff

## Insurance

We see that there is an increased interest in insurance companies to move to blockchain technologies for increased transparency, accurate risk tracking, and reducing operational costs. New age startups such as SafeShare, Wetrust, Slice are incorporating distributed ledger technologies as their core differentiator to power the future ecosystem fuelled by blockchain.

In this direction, we will partner with external insurance providers for providing host asset insurance. To facilitate accurate computation of premiums for these external insurance providers, we will share details such as reputation scores etc. (if a user is more reputable in the ecosystem, he pays reduced premiums etc.)

## Arbitration

When a booking/ service request is confirmed, issues may arise between the stakeholders when there is a discrepancy between what was promised and what was the reality, or if there is a violation in terms of rental/ service agreements.

To mitigate losses in these cases, we use elements from p2p insurance and will have a guarantor who can come in to provide his personal guarantee that an agreement will go through without any problems. For this the guarantor stakes their PPS tokens. When an agreement concluded without any issues the guarantor gets their tokens back and also a bonus (Either as PPS Tokens or reputation points) for taking the risk on the contract. A guarantor has access to the information about the parties involved, their ratings, the property information. Based on this information a guarantor can decide if he wants to partake in the guarantee process for the agreement.

## 3rd-party security

For issues related to damage of assets, mishaps to parties involved during stay etc., Populstay will partner with 3rd party blockchain based professional insurance providers. These partners will provide cover at a discounted rate and they will have secure access to key aspects of parties/assets of a deal through an API which will facilitate risk evaluation and premium computations. We are in talks with insurance providers such as safe share (<http://www.safeshareinsurance.com/>), slice to be our partners. Since we have a very robust user identification model, we will help these third party providers with the risk assessment strategy and hence the price of these operators will be 10- 15% lower than the market price

## Identity management

### User validation

Users can join the Populstay ecosystem through our DApp's user-friendly interface. As explained before, Populstay has very strict KYC and KYP protocols to ensure only genuine persons are a part of the system.

While it is common for companies to have strict internal teams for validating and approving users as being authentic, we realise that since the user information will be a part of blockchain it's only fitting to make this process as a community driven management activity with eligible members (with appropriate reputation score) helping in the activity and being rewarded for this activity.

The typical process of new user registration will be :

- 1) A new member registers his/her account using the Populstay DApp while entering and uploading all necessary supporting documentation.
- 2) This information is stored in the blockchain infrastructure in decentralized databases (such as IPFS) with a unique ID being generated for the user.
- 3) Next, a KYC validation request is broadcast to a randomly selected subset from qualifying users (who have a minimum reputation score in the system). These users pick up the KYC validation request and perform the validation.
- 4) Once the validation is complete the user's details are added to the blockchain through a smart contract and the reputation score will be computed and associated with the user.

### Listing Identity

Listings will be validated in a similar way to new user management, i.e., when a existing user lists his/her property into the Populstay DApp (with details such as pictures, price points, durations, property details), it will be encrypted and stored in the datastore. After this a randomly chosen subset of eligible community users are broadcast with the details of the property which they will verify for its authenticity. Once the authenticity is established, the minimal details about the listing is stored on the blockchain with a reference to the location of the asset files of the listing. Community users will again be awarded PPS tokens and also gain reputation points for these efforts.

## Review Verification

For every review in the Populstay system, once the payment processing and stay has been completed, the review will be put up on the blockchain with references to the datastore.

## Reputation management

Managing reputation is an important aspect of a peer-to-peer, self regulated ecosystem where real value is exchanged. This ensures, genuine and serious players in the ecosystem are incentivised to be a part of the ecosystem, feel safe and are comfortable exchanging value in the network. Similarly, bad players should be disincentivized to be a part of the ecosystem.

Each Member of the Populstay ecosystem will have a reputation score. The reputation score is a function of the activities of the member in the network. Parts of the systems functions such as verification, arbitration, instant booking etc., need a minimum reputation score to be available for a user. Every task that a user does on the Populstay network directly affects to increase or decrease his/her reputation score.

- 1) Verified identity ( V I )
- 2) Verified Listings ( V L )
- 3) Number of years in the community ( A G )
- 4) Participation in community activities ( such as verifying new users, validating listing, validating reviews) (CA)
- 5) Total value exchanged in the network ( total value of transactions and average transaction value) (TVE)
- 6) Reliability (Percentage of transactions performed without any issues) ( R E L )
- 7) Participation in dispute resolution ( Number of successful cases in which a user was involved in arbitration) (PDR)
- 8) Reviews (Review and rating by other users) ( R R )

Reputation score will be a 10 point system

$$\text{Reputation score} = \text{VI} + \text{VL} + \text{AGE} + \text{CA} + \text{TVE} + \text{REL} + \text{PDR} + \text{RR}$$

where

**VI** = ( If a user is verified for his identity by the community, then VI evaluates to 0.5, else it is set to 0)

**VL** = (Depending on the number of verifies listings that a user has, this score evaluates to a maximum score of 1)

$$1 * \left( 1 - \frac{1}{1 + \sum (\text{number of verified listings})} \right)$$

**AG** =  $0.25 * \left( \frac{\min(2, \text{AGE})}{2} \right)$  (Active users who are with the platform for at least 2 years are given .25 reputation point, else this score depends on how many years they are with the platform)

**CA** =  $2 * \left( 1 - \frac{1}{1 + \sum (\text{number of community activities})} \right)$  (In Populstay network, the community participates in authenticating users, new listings and approving reviews. For every such activity the user's reputation increases)

**TVE** =  $0.25 * (\text{percentile based on total value exchanged among all users})$  (The total value of transactions that a user makes is treated as an important factor)

**REL** =  $1 * \left( \frac{\text{transactions with no issues}}{\min(1, \text{total transactions})} \right)$  (The total transactions that a user is involved in without issues (any disputes etc) are also weighted)

**PDR** =  $1 * \left( 1 - \frac{1}{1 + \sum (\text{successful arbitration}) - \sum (\text{unsuccessful arbitration})} \right)$  ( Users who participate in arbitration are rewarded with reputation points)

**RR=**

$$4 * \min \left( \left( \frac{(\text{number of ratings as guest} * \text{average guest rating}) + 2 * (\text{number of ratings as host} * \text{average host rating})}{5 * \text{total number of ratings}} \right), 1 \right)$$

(Among the total verified reviews (and their ratings) assigned to the users, reviews as host and as a guest are treated separately. Ratings accrued as a host are valued more than as a guest)

## Dispute resolution

One of the crucial aspects of the success of a blockchain based sharing and management solution is how to facilitate arbitration. It is inevitable that disputes will occur between hosts, guests, and other 3rd party providers. Providing a suitable arbitration mechanism to address such grievances is crucial. In general a jury based system is best suited for facilitating arbitrage in a decentralised setting such as blockchains. Arbitrators will be chosen in a principled fashion for every grievance. These Arbitrators will preside over the evidence presented to them and decide on the outcome (based on majority voting strategy).

A grievance channel can be setup by either parties as an extension of the main smart contracts and the populstay protocol. A grievance channel will have a deposit of a set number of tokens for resolving disputes. We envision a side chain which tracks contains all the encrypted details of the dispute (while referencing to the original populstay chain) for archival purposes.

Once either party enters a dispute, a grievance channel is opened which contains evidence for the issue (such as pictures, videos, communicated proofs etc.) to the grievance channel. The other party might acknowledge the issue and will have an option to compensate with PPS tokens. This provision will be made in the smart contract. Similarly, in a case where a host is unhappy with the guest, and the guest acknowledges this, then the host has an option to withhold some of the PPS tokens that were a part of the security deposit. The grievance channel is fundamentally linked to the original smart contract. The party in the grievance channel who is found guilty of the issue will have his reputation points penalized by the system.

In case, the issue is not mutually solved even after opening a grievance channel, the channel is now upgraded to a higher priority and will go into arbitration by a jury. The party filing for the

dispute will now have to augment the channel with details of the numbers of arbitrators (should be a odd number), the deposit fee, the demography and profile of arbitrators etc. Next, the algorithm (which uses some pseudo random permutation which is dependant also on the reputation score and the criterias set by the party opening the grievance) picks a set of potential arbitrators. Next the arbitrators have a choice to accept being a part of the jury, if people reject then a fresh round of picking is done until the number of arbitrators satisfies the criteria set up in the grievance channel. Both parties will have a fixed time window in which proofs have to be submitted (such as pictures, other documents etc.,). These assets will again be stored in a IPFS based backend. The Arbitrators will have a look at the evidence and discuss, can counter question either parties before making a choice on the winning side. Arbitrators who correctly identify the eventual winning side will be awarded part of the deposit fee.

Once an outcome has been achieved, either party will have a fixed time window to appeal against the ruling by depositing additional tokens as deposit. In this case the previous process restarts with a new jury being selected ( not the same arbitrators).

There will be no appeal possible after the 2nd round. After the 2nd round if either party is still not satisfied, a decision will be made by an algorithm which consolidates the outcomes of all previous rounds of jury voting and pronounce a decision.

In the extreme case that jury-based arbitration does not work, Populstay will step in to resolve the issue. In Fact there are many services which are specifically offering such services such as the OATH protocol. Their strategy is very similar to us, we are in talks with their team and wish to partner with them for the dispute resolution mechanism.

## Marketplace

Any sharing ecosystem's success depends of how well it helps its stakeholders access to other allied and necessary services around the core business of short term rental which makes the experience of the guest and host worthwhile and hassle free. These may include third party services such as car-share, local transportation, cleaning services, offers from tour operators, activity booking, restaurants, tour guides, shopping/unique speciality experience, photoshoot etc. The Populstay ecosystem will facilitate such third parties to offer their services.

These 3rd party providers will accept PPS Tokens for their services. They need to register themselves on the blockchain which needs to be approved by Populstay members.

These external providers will also be subject to review and reputation model. If the rating of providers is below par, they will be removed from the community automatically.

Just as any other deal, a smart contract will drive the engagement between a user and the external service provider.

## AI and Machine Learning Layer

One of the key differentiators of our platform is that we will strive to better our platform with the power of AI and Machine learning. Given that we are generating a lot of data on the platform, we can use the power of learning to improve the overall Populstay experience and also get directions of how to improve Populstay as a product.

In addition, we recognize that the blockchain technology landscape is every evolving and is still at its infancy in terms of some of the real life practical problems such as scale, standardization etc.,

Since we fundamentally a Technology company with a research DNA, we wish to invest in research on core challenges of blockchains and also play a role in community outreach on the power and potential of blockchain as a driver of the future of society 4.0.

Aspects in which machine learning can play a role for improving the Populstay platform are:

- 1) Better Scoring Mechanisms
- 2) Better Recommendation services
- 3) Predictive Forecasting
- 4) Risk assessment strategies



## Roadmap

### 2018 Q1

- Company launch
- Tokyo government incubation (IOTA, Lykke, Populstay)
- Seed-funding
- Prototype smart-locks
- Partnerships
- 30+ travel services
- 20.000+ restauration services
- 2.000+ listings

### 2018 Q2

- Demo software platform
- Bitmain strategic investment
- Qtum strategic partnership & investment
- Top 16 in HFTP in Houston, Texas
- Japan home-sharing legalization

### 2018 Q3

- Partnerships with 5.000 listings
- Jeffrey Wernick strategic advisor
- Guest speaker at JBaas Blockchain Summit, Tokyo
- Guest speaker at HTNG Asia in Macau, China

### 2018 Q4

- Private sale
- Smart-locks MVP & mass production
- Guest Speaker at Blockcon 2018, CA Santa Monica
- Guest Speaker at a Japanese Embassy hosted event

## 2019 Q1

- Testnet release
- Public sale
- Large scale marketing

## 2019 Q2

- Mainnet deployment & MVP
- Partnerships with 10.000+ listings
- Expand into Singapore

## 2019 Q3

- Partnerships with 20.000+ listings
- Expand into China
- Expand into USA

## 2019 Q4

- Demo hospitality experiences
- Partnerships with 50.000+ listings
- Expand into UK
- Expand into France
- Rugby World Cup, Tokyo

## 2020

- MVP hospitality experiences
- Partnerships with 100.000+ listings
- IoT ecosystem integration
- Olympic Games, Tokyo

## Core Team



### [Dr. Walter Wang Yue](#), Founder & CEO

He obtained the Bachelor's degree in Computer Science in 2008, and Ph.D. in computational biology in 2013 from National University of Singapore. He also served as a visiting scholar to **Imperial College London** to research on MRI data from Alzheimer's disease in 2012. His publication has received in a total of 160 citations.

He was a **Lead Data Scientist** of Singtel's spin-off DataSpark which focuses on geo-location data analysis from Teleco, where he won the outstanding staff award and led a million dollar big data project between 2013 and 2015.

He was an early investor in Bitcoin and Ripple since 2014, and became interested in Blockchain ever since. Since 2015 July, he has co-founded Igloohome with 2 other associates, a spin-off from Singtel via an internal hackathon. Their product won the CES Asia Innovation Award in 2017 & 2018 and was praised by Lee Hsien Loong, **Prime Minister of Singapore** as one of the most innovative products invented in the country. He left the company on 31st of December to embrace the new challenges in blockchain industry.



### [Brain Lin](#), Co-Founder & Business Development

Shanghai Drama School, Public Media bachelor. Shanghai Jiaotong University Fahua business school. Digital marketing director of Sunshine Lion Advertisement in Great China Region. He is a serial entrepreneur, and angel investor. He has founded the "Want To Be" startup.



### [Roberto Marchetto](#), Technical Lead

Roberto is a former **Google**, **Imperial College London** and **European Space Agency Software Engineer**. After his graduation in Statistics, he ran and sold a profitable IT startup during the years of the financial crisis in 2008 and then moved to UK, The Netherlands and Germany. This gave him the opportunity to work for both huge corporates and startups as IT consultant and team lead. Known for his quality of code, he is passionate about Blockchain, Italian food and salsa dancing.



### **John Lai, Full Stack Developer**

John has several years experience developing robust code for high-volume businesses. Designed the overall system architecture and increased code-efficiency of [www.populstay.com](http://www.populstay.com) and is leading our development team together with Roberto. He also spearheaded a team that won the ChimeHack 4 Award for Best Product Design. Has also won several hackathon, including the famous **Walmart Labs** hackathon that took place in Silicon Valley.



### **Christie Zhong, Chief Creative Officer**

Christie graduated from the Nanyang Academy of Fine Arts (NAFA) in 2009 , during her school time she won the Singapore Institute of Design Presidential Award. In 2010 she worked for Mediacorp to revamp the Xin.MSN. She also owned her own studio with customers including well-known brands like Unilever, **Coca-Cola**, Watsons and so on. During 2015-2016 she worked at **Barclays** for branding & marketing.



### **Periklis Ikonmidis, Chief Marketing Officer**

Periklis is a former Sales Director for Wotabu, a travel company where he was successfully leading large sales teams around Europe. Over the years, he built his own personal coaching brand and has given two **TEDx Talks** in two different languages. Being an experienced marketer, he's helped different blockchain companies organically grow their communities and raise funds. He's an avid crypto-asset investor and enjoys good games of chess.

## Core Advisors



### Yuqing Tan

Mr. Tan is a member of China Democratic National Construction Association. Before working as the co-founder of Shenzhen Biochemilogic Technology Co. Ltd., he has co-founded a number of high-tech enterprises in China. In 2009, he was certified as a Senior Engineer by Chinese Ministry of Information. He was also selected as a member of experts' pool by Shenzhen Municipal Science and Technology Innovation Committee since 2014.

As a startup leader, Mr. Tan led his team to get the award of Shenzhen Venture Star Contest enterprise (Nanshan District) Mr. Tan has declared nearly **30 patents** so far, and more than ten patents have been licensed.



### Sucheendra Kumar

Sucheendra leads technology teams for a services company based out of Japan. He obtained his **Ph.D. in Computer Science** in 2013 from National University of Singapore. His core interests lie at the crossroads of computational and complex systems. He has over 10 years of experience in advancing and adopting cutting-edge research in Computer Science for advancements in healthcare and related domains.



### Emi Wada

Emi Wada graduated from Tokyo's International Christian University. Taking advantage of her language experience, she worked as an interpreter at numerous events up to 1000 attendees,. She is also a professional for 10 years engaged in the Finance industry, investment advisory business and education in stocks and Forex.. Currently she conducts advisory for ICO projects in various countries and works with Japanese influencers. She'll be helping us expand our market there.

### Jeffrey Wernick



Jeffrey Wernick is a venture capitalist whose portfolio includes early holdings in **Uber** and **Airbnb**. Wernick started buying **Bitcoin** in **2009**. In the 1980s he sold one of his company, virtually making all his employees millionaires. He studied at the University of Chicago, where he also began trading options. Then started working at Salomon Brothers and continued his career at the National Bank of Detroit where he became the youngest Senior Officer in the bank's history. He is an advisor for **Qtum**.

### Aurora Wong



Aurora is an experienced professional in the fields of finance, start-ups, investment, and Management. In 2016 she founded a global leading digital-asset fund called **Crypto Capital**. Her educational and professional experience enabled her to build strong and lasting professional relationships with '**Fortune 500**' companies, leading financial institutions, venture capitalists and entrepreneurs. Her previous working experience includes the World Bank, **Merrill Lynch**, and the Boston Consulting Group.

### Tiffany Xingyu Wang



Tiffany is a private investor and advisor in blockchain, AI and quantum mechanic startups, currently based in San Francisco. In the blockchain space, her notable investments include **Telegram**, Quoine, Cashbet, and **Origin**. She also advised **Southeast Asian governments** on energy policies and on One Road One Belt investments from China to Southeast Asia. Tiffany holds MBA from the **Wharton School**, Masters of International Finance from Sciences Po, Paris, and Bachelor of Law from Fudan University. She speaks fluently French and Mandarin for her investments in francophone African region and Asia.

## Seed-funding investors

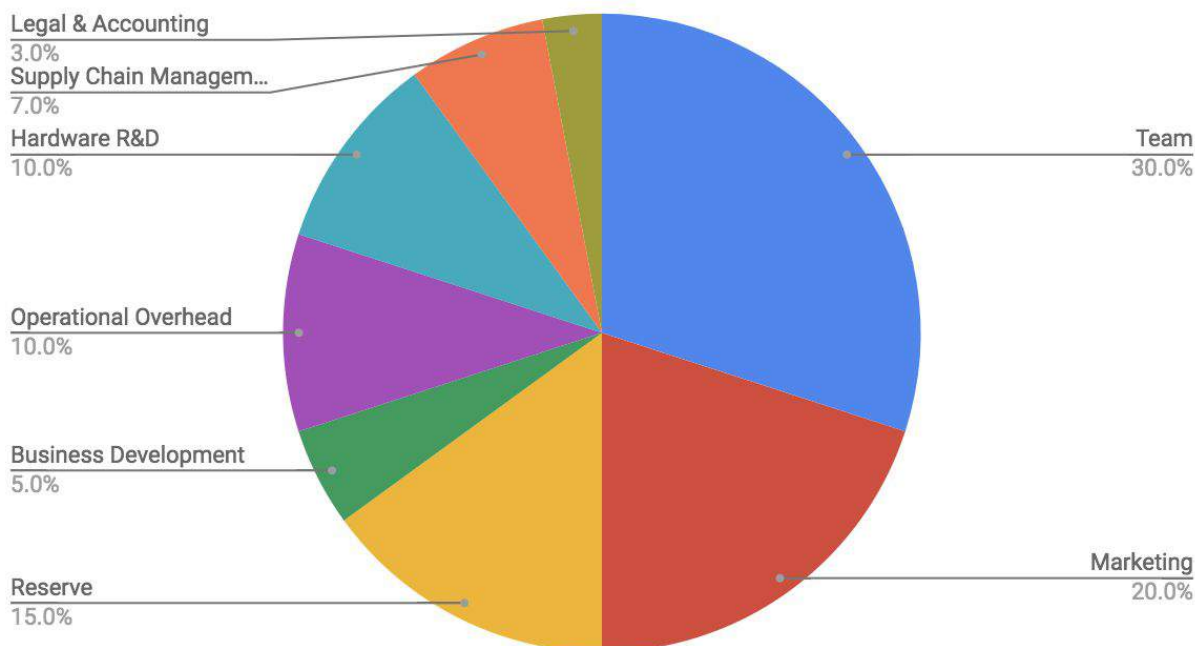


# BITMAIN



# CRYPTO CAPITAL

## Funding Usage



## Legal procedures

### Japan

According to the company, there are already 52,000 Airbnb listings in Japan. Airbnb accommodated 3.7 million of those visitors in 2016 for the Japanese market. Also, the Japanese government aims to raise the number of visitors to 40 million by 2020. The number of visitors from overseas will probably continue to reach record highs as Japan prepares to host the World Rugby Cup in 2019 and the Olympic games the following year. Huge demand from the foreign visitors coupled with a shortage of hotel rooms leads to the open and collaborative manner from the government.

The good news is that short-term rental will become legal in Japan officially from June 2018 after the government passes a law that sets out rules for home sharing. Japan's upper house passed a legislative bill in June 2017 that allows private homes rent out space to paying guests while limiting total stays to 180 nights a year. The law requires providers of such accommodation to register with local governments and lets local authorities impose their own restrictions.



## Singapore

Housing and Development Board (“HDB”) and the Urban Redevelopment Authority (“URA”) provide guidelines on the legal perspective of short-term rentals in Singapore.

For public housing:

- The Housing and Development Act and its various subsidiary legislation, which govern public housing in Singapore (i.e. HDB flats), are available [here](#).
- The HDB has promulgated subletting regulations on the renting out of entire HDB flats and bedrooms [here](#). These regulations impose a minimum rental period of six months, as well as various other restrictions, including who you may rent to.

For private residential properties (i.e. not HDB flats):

- The use of private residential properties is governed by the Planning Act and its various subsidiary legislations, which are available [here](#).
- The Planning Act was amended with effect from 30th June 2017 to allow rental of private residential properties for not less than three consecutive months to the same person.
- The Ministry of National Development (“MND”) has announced that URA is studying the option of creating a new use category for private residences that wish to engage in short-term rentals of less than three months in duration, subject to a set of guidelines which URA is looking into. We understand that URA will be engaging and consulting with stakeholders in this regard.

It is expected that in the near future, Singapore will regulate the short-term rental like other Megacities to make it legal to operate such business.

## China

As one of the most westernized cities and the most popular foreign tourist destination in China, Shanghai released 4 types of regulations about the short-term rental in October 2017. They are:

1. <The guideline for a host to deal with complaints>
2. <The requirement for residential rental near theme park rental>
3. <The requirement for short-term rental near tourism place>
4. <The boutique hotel guideline>

From the above four regulations and guideline, it clearly shows that the government still try to make sure the short-term services are up to standard compared to the hotel, instead of imposing

a tax and limiting the number of days for rental. However, the short-term rental owners need to get the business permit from the government since China has strict inbound visitors' registration control.

## France

Paris is one of Airbnb's most popular destinations. According to the statistics in March 2017, there are a total of 55,000 listings available to book. According to current legislation, short-term means you rent for less than 1 year / 9 months to a student. There are proposals to reduce the definition to a shorter period of time. But for the moment the existing law applies.

To operate vacation/short-term rental legally, the owner(s) need to proof first when renting out a Paris property short-term. They need to demo to the Mairie that they're authorized to rent out. This needs to come from the syndic (managing agents of your building).

Furthermore, the listing party must register the information with the Mairie (Town Hall), and obtain a registration number. The number must be listed on the online listing. If owners earn more than €5,000 a year, they are liable to pay income tax on their rental earnings.

Each property is allowed to short-term rental for less than 120 days if the property is the owner's primary residence. Regarding the secondary property which applies to most of the international owners, to rent less than 1 year, it is still legally possible but requires commercial zoning which needs local legal advice.

## USA

According to Department of Buildings, and the Department of Finance, short-term rental in New York may require a business license or permit to legally operate in New York. In addition, the New York State Multiple Dwelling Law restricts renting out for less than 30 days for Class A multiple dwelling. The definition of "Class A" and "multiple dwelling" are available in Sections 4-7 and 4-8 of Article 1 of the Multiple Dwelling Law. The law exempts rentals to a "boarder, roomer or lodger," which has been interpreted to mean that, in general, if a guest shares the apartment with a permanent resident who is present for the duration of the rental (i.e., a "shared space" rental); it is permissible under the Multiple Dwelling Law. The New York City Zoning Code sets out the city regulations on zoning, which may apply to our chosen listing. Chapter 2 how the hotel is defined that could affect our listings.

In terms of rent control, The New York Administrative Code (available under "ADC" on New York State's website) sets out rules for rent stabilized (Section 26-501-26-520) and rent control

(Section 26-401-26-415) properties. To make our property more legal complied, we may consider avoiding acquire and manage to list under rental control.

State sales and use tax, together with city hotel room occupancy tax and state and city nightly tax may be applied to our listings if our listings are categorized as hotels in the abovementioned definition.

## United Kingdom

Short-term rentals in Greater London are subject to a planning restriction. In 2015, the Government exempts this restriction as long as the transient stay of the calendar days is less than 90 days, and the owner is liable to pay the council tax. However, certain residential premises are not allowed to use for short-term rental. It is subject to approval by the local community

To abide by the local laws in London, our system will only rent out the rooms on Airbnb for less than 90 days and our platform the remaining calendar days of stay.

More information can be found [here](#). The provisions of the Deregulation Act are explained [here](#). The Government's policy statement, outlining the rationale for the new rules, is [here](#).

## Investor's risk and disclaimer

This is a white paper about Populstay's current and future plans and roadmap. Unless specified and referenced for the project background, the rest of the project and business model are still at its early stage. An investor should be clear that this is a high-risk project and there is no promise of any interest, a dividend or other forms of return.

Investing in the token and project means that you are fully aware of the risk and consequence of the project. An investor will not seek any form of indemnification of any situation for any request against Populstay.

Although the data used in this whitepaper comes from the partners of Populstay, it does not mean Populstay can verify the quality and truth of the data source. The market situation may vary based on the economic situation, hence; any project in the white paper may be invalid along the line.

The white paper can only be downloaded from [www.populstay.com](http://www.populstay.com); it is not permissible to distribute the copy without the permission of the company.

After reading the white paper, the reader can understand and agree to the above-mentioned risk, limitation and conditions. The white paper will be translated into another language, if there is any inconsistency among the different languages, please use the English version for reference.