Tokenisation of Airline Seats (tickets)

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An airline is exploring benefits of introducing blockchain technology and smart contracts into a pilot project. Instead of selling seats (tickets) to a particular destination like airlines usually do, it is contemplated to sell tokens that represent a seat on a particular route, but do not yet have a particular passenger, time and date assigned to it. That is, an airline receives money but does not yet issue a ticket. Instead, it issues a token that can buy that ticket later fixing passenger, date and time.

You can consider a token to be a “route private money” that has a supply equal to the total number of tickets on this route within a range of time.

Once tokens are sold by airline these can be traded, transferred or exchanged by their first owners many times before these will be exchanged for a ticket.

Business case

- Promoting underserved destination
- Using Token Economy positive externalities such as alignment of the goals of token holders and airline for the benefit of both parties.
- Knowledge and technology acquisition
- Publicity and community building
- Use case for other destinations
- Code-base for further applications

Unique value proposition

- Transferability of the purchased seat to a new passenger. Usual tickets are not transferable or transferable for a significant fee. A token, which represents a seat to be redeemed on a particular destination can be easily transferred to a new owner
- Tradability of a seat - usual tickets are not tradable - they are issued to a particular person. Usually, tickets loose value once transferred to another person. In contrast, tokens representing a ticket to/from particular destination can gain in value due to rising demand to fly there that will surpass the number of tokens issued.
- The flexibility of a seat redemption. The usual seat has a fixed date of the flight and can be changed for a fee. The token can be considered an option that gives you right to purchase a seat on a particular destination within an agreed range of dates.

Technology brief

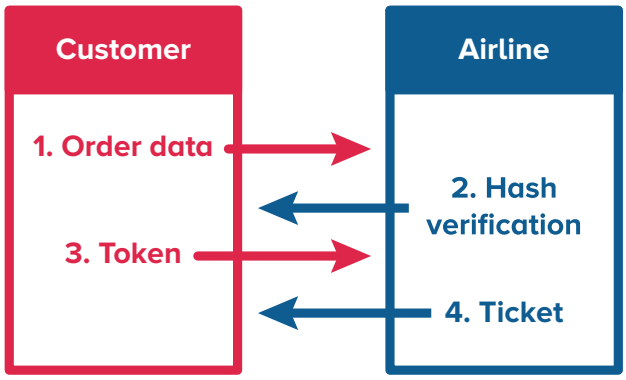
- A token is a digital object created on an Ethereum (or any other blockchain eg Cardano, NEO supporting ownable, transferable and tradable digital objects)
- Token along with the information on its owner is stored in a distributed, public and immutable blockchain file along with the information about its owner represented by owners address (public key).
- Token transfers are similar to transfers of cryptocurrency eg Bitcoin and require a Wallet that stores public and private keys and creates a signature (digital witness) that validates the request to assign ownership of the token to another owner.
- The token transfer requires payment of a transaction fee to use eg Ethereum transfer protocol. Such transaction fee cannot be paid by token or its fraction itself but has to be paid by a native currency of the blockchain.

Challenges

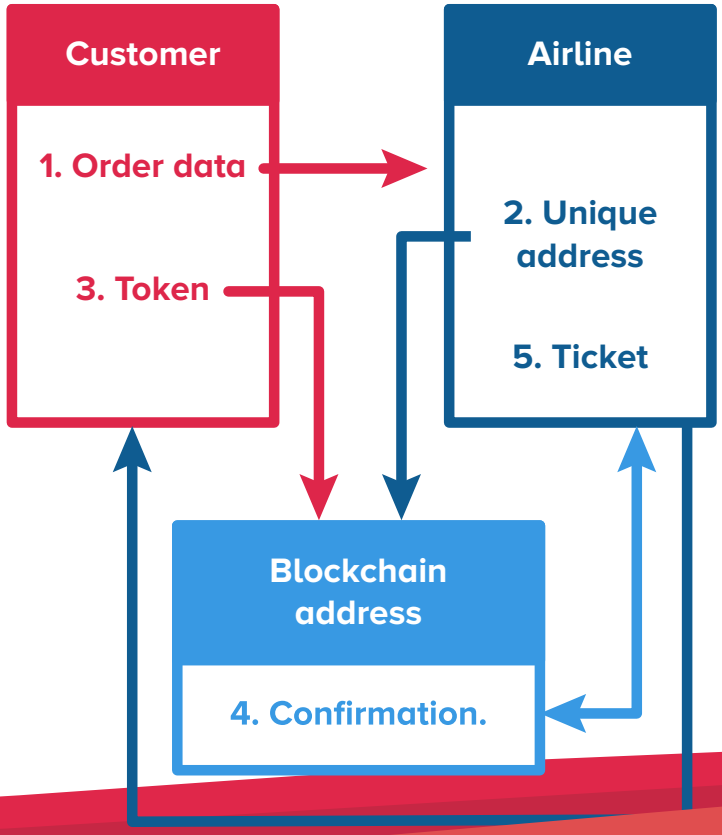
1) How to redeem a seat for a token?

- Why is it a challenge? A token is an object existing on the blockchain, but a “seat” exists in the internal systems of the airline and has to be validated in the airport ecosystem - check-in, security, etc.
- Approach to solving the challenge is to figure out a bridge that enables the easy and secure exchange of the token existing on the blockchain for a seat that needs to exist off-the-chain.
- Bad solution - use payload option and ask passengers to send tokens back to the airline address along with passenger e-mail in a payload. Why bad - airline will need to trigger some authentification eg send some gift card code to the e-mail that can redeem the seat online. Another bad thing is that sent e-mail will be public.
- Not so bad solution - use traditional airline checkout process and enable payment option “TOKEN”, if the route and date range matches tokenisation campaign. If selected generate a unique hash that has to be sent in a payload of the transaction that transfers the token back to the airline as a payment for the seat. Why not

good enough - “payload” is not a popular feature used by consumers and is not available in all wallets.



- Better solution - again, use traditional web purchase flow, offer “TOKEN” payment option and if selected - generate a UNIQUE address to send a token to pay for the redemption of the chosen seat. After the user has selected this option, the airline is reserving this seat, say, for 24 hours and is querying blockchain file (an API eg Blockcypher) to see, if this unique address has got the token transfer. If it has got it is unequivocal proof that a particular seat has been paid.



2) How to pay transaction fees associated with token redemption or transfer? If, say, I got 5 tokens and want to gift few of them to friends - blockchain transaction fees apply in native ETH currency

- Why it is a challenge? It is not a challenge if the user already has a wallet and some cryptocurrency, but if not it will require some effort and customer support to explain how to buy some Ether with a credit card and set up an optimal TX fee.
- How to solve it - think about either making potentially frustrating path easy by involving exchange partners or customer support / easy tutorials or taking the burden of transaction fees to the airline.
- Potential solution - when you sell token or give it away, send some amount of ETH to the receiving address, say, 1-3 dollars that will reside there to offset potential transaction fees.

Risks

1. Users might find it difficult to understand the process of token acquisition as they will need to download and set up a Wallet app along with the creation of their human-non-readable address.
2. Users might lose their private key or delete the app or purchase a new phone without transferring app data to the new one. In result, they lose access to the tokens.
3. Users might become victims of a phishing attack and give away their private key.
4. Legal risks assessment is outside of the scope of this document, however, the areas to explore are as follows
   - understanding of prerequisites and implication of potential selling of a crypto-object in exchange for fiat money as well as tradability of this object and potential speculative assessment of its nature by regulating authorities.

Technology stack and user stories

- As a customer I want an easy checkout process even for a new type of product that airline is offering. Technically, the user just needs to use a usual web page or mobile app (airline native or miles app) to indicate a number of tokens to be purchased by credit card or in exchange for points. Then user inserts its Ethereum address and pays. After confirming the payment airline is transferring the token to the indicated address. The potential challenge here is a necessity to obtain said Ethereum address - download suggested an app, set it up, get the address and paste it. Alternatively, the airline can keep the token in escrow and maintain it on its own ETH address indicating its ownership to a customer in its account (registered customer only). However, it kills the idea a bit as well as such token is not transferable or tradable.
- As a customer I want an easy way to use my token for the redemption of a seat/ solution described above.
- As an airline I want to track number if given away or sold tokens, token transfers on the secondary market, token redemption activity, token circulating supply in relation to available seats.

Discussion points

- Onboarding strategy - token/fiat exchange or targeted airdrops to ignite community and token economy - people owning something that can grow in value in response to their actions usually start to execute them. For example, promoting the destination, following, sharing and commenting the news on the destination. Recommending the airline and destination. Just telling stories about them owning a very unusual object - token.
- Token value dynamics assessment - if you issue the amount that is, say, 80% of potential seat/persons within a given time-frame then after day one of the operations the token value will drop as its supply will be larger than available seat/persons.
- Will you make this destination TOKEN ONLY or will you leave a chance to buy tickets for fiat? Token only will drive demand for tokens and consumer unrest and potential claims of legal conformity of selling services in a currency other than EUR.

Notes

- All tokens within a usual smart contract are the same and indistinguishable.
- On a business level it means that unless we create additional rules eg we say that tickets redeemed for tokens within 30 or more days before travel also have a free luggage allowance, each token holder will expect to be treated equally. Irrespectively of how much he or she has paid for the token.