

GOeureka



GOeureka:
Technical Whitepaper
v1



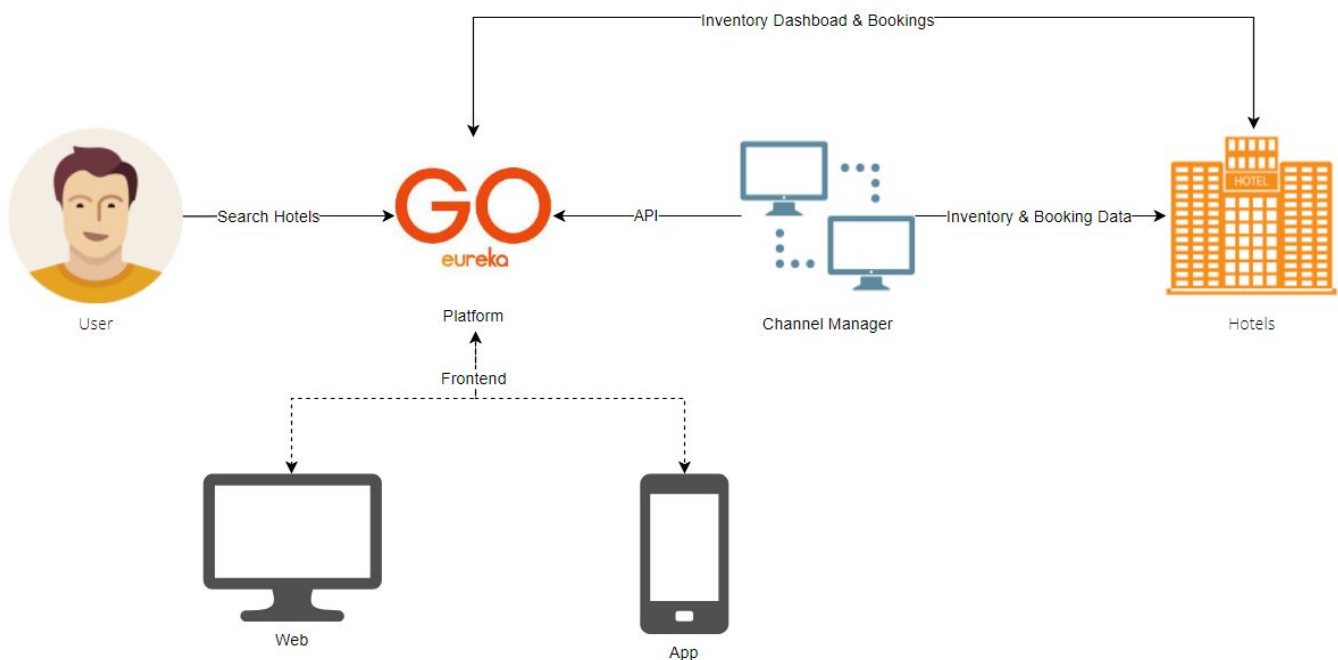
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Introduction

GOeureka is an online booking platform that leverages blockchain technology to tackle current issues in the travel industry such as high commission structures imposed by online travel agencies (OTAs) and the fragmented loyalty programmes within the hotel industry. The platform is a partially decentralised web and app platform to provide travellers and hotels direct access to communicate with each other.

GOeureka's technical roadmap presents plans for a fully decentralized platform, as well as a loyalty network blockchain to facilitate interoperable loyalty points across the travel industry and possibly across the retail industry. This technical whitepaper outlines the technology behind the platform and the data that will be processed off-chain and on-chain.



Developer Stack:

- HTML, CSS, JavaScript, Ionic Framework (Frontend)
- Python, Django, Golang, NodeJS, Solidity, RESTful API (Backend)
- PostgreSQL, AWS (DB & Hosting)
- Ethereum Blockchain & ERC20 Smart Contracts

Platform Overview



GOeureka aims to develop an easy to use, reliable Facility and Services booking system with persistent indisputable records. As with all new systems, much of what is proposed will evolve over time as requirements change. The web platform will be developed with a backend built on the Python Django framework while individual components will be built using a mix of programming languages (HTML, CSS, Javascript, Golang, etc.) and the mobile application built on the Ionic framework. The database will be a PostgreSQL database that runs on a cloud server (Amazon Web Service) with certain data validated and stored on the Ethereum blockchain. Smart contracts will be ERC20 compliant (though newer standards may be applied after the time of writing) and customized using Solidity.

ERC20 smart contracts will be utilized for the security and immutability of data throughout the platform. To increase performance and keep transaction fees to a minimum, individual transactions and bookings will be kept outside of the blockchain. The settlement of all transactions will occur off-chain and fulfilled transactions will be aggregated each day and sent through the smart contract to be validated and stored on the blockchain.

It is a key goal that the GOeureka platform provides for widespread usage, therefore utmost priority will be given to platform performance, user interface and experience. Majority of the

system will be built in off-chain components but critical information will be stored in persistent smart contracts. The critical factors addressed are:

- The design of a secure mobile wallet that the average user feels comfortable using and is recoverable by the same user in the event of a lost device.
- The GO token which can be held, spent or traded.
- The GO credits which offers preferential rates when purchasing products and services.
 - An exchange allowing the purchase of GO credits in exchange for GO tokens
- A management system to allow booking and recording of scarce, non-fungible resources (e.g. room-nights). Making this booking comes from:
 - payment of deposit in GO credits (automatic)
 - acknowledgement by the payment facilities during deposit through classic methods
- A booking and payment system for less scarce resources - e.g. spa sessions, meals, activities etc.

Why Ethereum blockchain?

The blockchain provides GOeureka with the required token economics needed to eliminate high commission fees and the ability to facilitate interoperable loyalty points. GOeureka's platform also benefits from the distributed ledger technology that guarantees security and transparency across its platform.

GOeureka chose the Ethereum blockchain due to its flexible and extensible nature. The use of Ethereum smart contracts allows for the creation of "autonomous agents" that may be implemented throughout GOeureka's platform to automate many processes and remove various third-parties that usually result in a slower process and multiple transaction fees that lead to high costs.

While moving towards a fully decentralized platform, GOeureka will look into the adoption of key blockchain technologies such as zero knowledge proofs, off-chain computation solutions and recently introduced Ethereum technology like the Plasma and Raiden network.

Web Application Platform

Booking & Inventory Platform

The web application platform will host a booking platform for travellers and a hotel inventory system for hotels. Travellers will be able to search and book hotels. Hotels can update room inventory and prices directly or integrate with channel managers. A majority of hotels manage their inventories using channel managers as a single point of management, therefore GOeureka will provide necessary APIs (Application Programming Interface) for integration. GOeureka will also work directly with major channel managers to automate the integration process for hotels.

Rebooking Feature

Travellers will enjoy automatic post-booking discounts for their stays through GOeureka's patent-pending rebooking feature. The GOeureka rebooking algorithm detects when a hotel rate drops, and automatically re-books an existing booking (qualified bookings that have not passed and are within valid cancellation policies) at the lower rate. Travellers will be notified of their discounted stay.

When hotels choose to drop their rates on the GOeureka platform, they will receive a summary report on the affected bookings and the total discounts provided by the rate cut. This will allow hotels to make true informed decisions that are beneficial to themselves and their guests.

GO store

The GO store is an in-app exchange for token holders to purchase GO credits using GO tokens. It is a safe and fast liquidation option for token holders to convert tokens into spendable fiat-value credits. Users enjoy discounted products and services on the GOeureka platform when purchasing with GO credits. GO credits are fiat-valued in-app credits that allows for instant transactions and off-chain settlement.

Token holders will redeem GO credits according to the prevailing market rate at time of exchange. GOeureka will rely on data sources from various exchanges and number of custom oracles to retrieve the average token price on the market. Users will use the proxy wallet detailed below to exchange GO tokens for GO credits.

The Proxy Wallet

One key issue typically faced when designing a blockchain system for mass adoption is the handling of user wallets. While a hardware wallet like a Ledger Nano or a plug in like Metamask can expect users to use a recovery phrase, general users are unlikely to be happy with such a solution.

We intend to use what is called a proxy wallet for all Ether transactions:

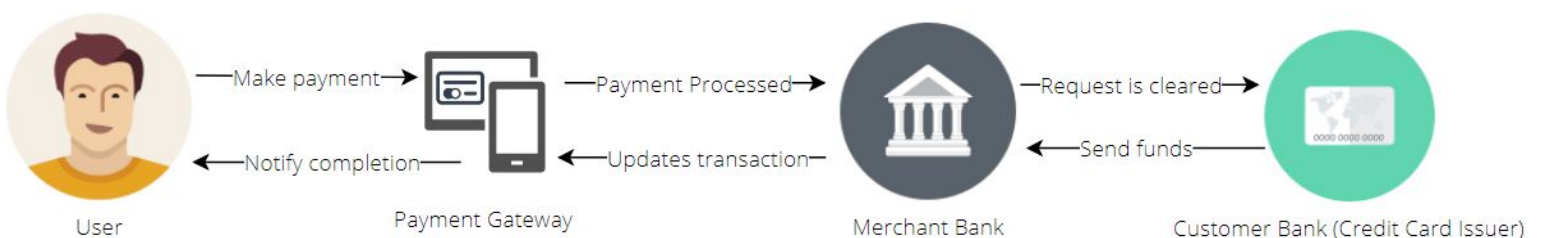
1. Users will undergo a proof of identity when signing up for GOeureka
2. Cryptographic Key Pairs are created on user devices and never leave their devices
3. A corresponding smart contract called a “proxy wallet” will be created on the blockchain
4. The user channels all transactions via the proxy wallet which is tied to the user’s identity
5. The proxy wallet allows the user to interact with all parts of the GOeureka system
6. On registration of a lost phone, GOeureka can, via a rigorous process, establish the identity of the account and assign that person’s new address to be the new controller of the proxy wallet.

The proxy wallet is already in use in several organisations.

Payment Processing

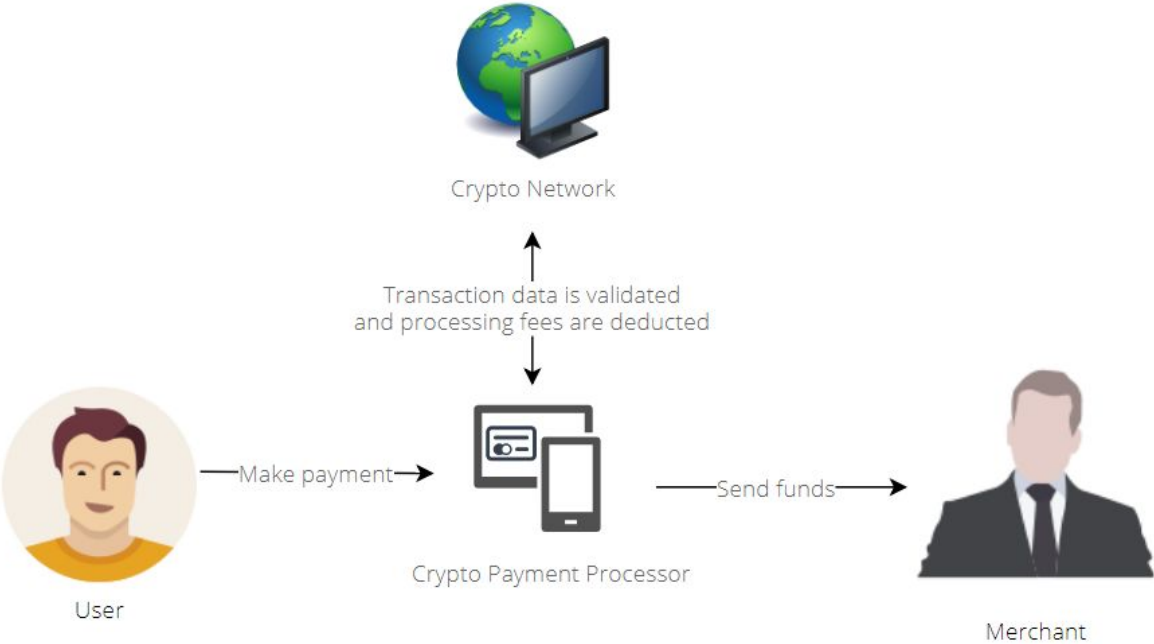
GOeureka aims to provide multiple payment methods that appeal to both traditional and crypto consumers. Consumers will have the option to transact using fiat currency, major cryptocurrencies, GO credits or loyalty points. Prices of goods and services will be displayed in fiat and the cryptocurrency of user’s choice. There are multiple available approaches for the development of GOeureka’s payment processing.

For the traditional checkout process where payment is made in fiat, GOeureka will implement a third-party payment gateway. This method sees payment being processed through a payment gateway (e.g. PayPal) that sends transaction details to a payment processing network (typically hosted by a merchant’s bank). Once processed, the processing network sends approved data to the credit card issuer to proceed with the funds transfer.



The common issues with traditional payments include prohibitively high fees (especially with foreign currencies), the lack of transparency by service providers, the need for multiple transacting parties and chargebacks that are a huge inconvenience to merchants. To tackle these issues, GOeureka will implement a crypto payment gateway, depending on available proven technologies available at the time of implementation.

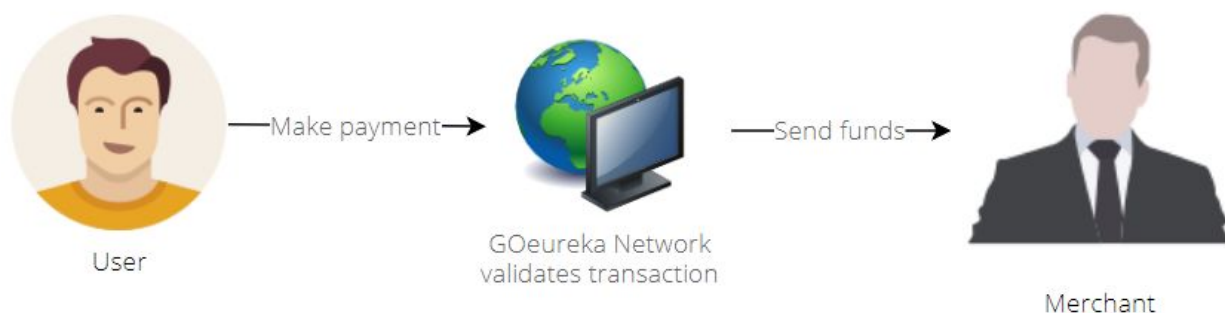
GOeureka looks to adopt successful crypto payment gateway providers like CoinPayments or Shapeshift (<https://www.coinpayments.net/> or <https://shapeshift.io>) that provides necessary merchant tools for the GOeureka platform. Recently, multiple providers have launched crypto wallet-as-a-service platforms (e.g. Block.io) which would be quick and easy to implement – usually via APIs. At the initial stage, GOeureka will implement these services to save on time and development costs.



Adopting crypto payment gateways eliminates the common issues faced by use of traditional payments. However, there are serious considerations that need to be thought through:

1. Processing fees charged by crypto payment service providers
2. Transaction fees that inflate due to blockchain congestion
3. Speed of transactions for on-chain settlement
4. Customizability of payment interface and protocols

Eventually, GOeureka will implement its own custom payment protocol to eliminate the processing middleman entirely and for greater control over crypto payments. Recent technological updates have seen the release of crypto payment protocols that GOeureka may customize and implement. The ultimate objective would be to eliminate transaction fees entirely.



Loyalty Programmes

Hotel loyalty programmes will be integrated into the GOeureka platform, where travellers may earn loyalty points from the hotels they have booked. Necessary APIs will be provided for hotels to link their loyalty database with GOeureka. This will help facilitate the interoperable loyalty points detailed in GOeureka's official whitepaper.

GOeureka will send and retrieve data from the hotel's database to provide real-time updates for users to track their points and for hotels to track points that users have redeemed with GOeureka.

Research shows that 70% of customers do not sign up for a loyalty programme due to inconvenience and time costs associated with registering for a programme¹. With GOeureka, registration for a loyalty programme is processed and verified in the backend. Customers will only be required to fill up an online registration form or, if they are already registered loyalty members, they only need to provide their pre-registered details (e.g. member ID) and the platform will link and display their loyalty details.

¹ <https://blog.accessdevelopment.com/customer-loyalty-statistics-2016-edition>

Services Dashboard & CMS

Hotels will have access to a services dashboard and content management system (CMS) that interacts with GOeureka's mobile application. Hotels are able to list services that they provide and directly communicate with guests during their stay. Hotels may subscribe to the following services:

- Housekeeping
- Concierge services
- Live chat
- Room service
- Events

In-app notifications will alert hotels when guests require a particular service. Hotels may update information and ongoing events in the vicinity, as well as their room service menu via the CMS.

Mobile Application Platform

The mobile application platform will act as an extension of the web application, with the same consumer-related functions. Additional mobile app functions are detailed below.

Check-in & Check-out

As consumer data will be shared between GOeureka and hotels, the consumers will have a seamless check-in experience during their stay. Upon registration, GOeureka collects personal identifiable information, which will be encrypted and stored off-chain. This information will be used to facilitate the check-in process since users are already authenticated on the GOeureka platform. Unique identifiers will be matched with data from the hotel's central reservation system and consumers are able to check-in directly on the mobile app.

The check-in experience will consist of 3 simple steps:

1. Select booking (reservation for the day)
2. Fill up optional information (hotels may request additional information to cater and personalize the consumers stay – e.g. Room upgrade, Types of pillow)
3. Check-in to room

Check-in requests will be automatically approved as long as certain prerequisites like the check-in time or booking deposit are fulfilled.

Guests may check-out of their stay through a similar process, but will be redirected to the payment page, where they may choose from GOeureka's various payment methods to settle their vacation bill:

1. Check-out of stay
2. Fill up check-out form (hotels may ask if guests have minibar consumption, guests may approve additional charges from in-room dining, etc.)
3. Redirect to payment page

Hotel Services

Upon check-in, authentication tokens will be sent to GOeureka's hotel CMS and guests will be matchmade with the hotel they have checked into once tokens are authenticated in the backend. Hotels and guests will have direct access to each other and will be able to communicate for the duration of the stay.

Guests will be entitled to the aforementioned hotel services, depending on what hotels make available.

Room Key

To provide full self-service capabilities, GOeureka will also provide a room key feature on the mobile app. The availability of the mobile room key depends on the hotel's physical infrastructure, but hotels with smart locks or keypad locks will have the room key feature integrated on GOeureka's app.

GOeureka will integrate available developer APIs by major smart lock providers. This technology makes use of encrypted Bluetooth technology, where authenticated data is sent from the GOeureka app through the guest's mobile device to the smart lock network which then unlocks a guest's room. Bluetooth technology is found to be a safer alternative due to encryption and authentication methods available for Bluetooth transmission as opposed to Wi-Fi protocols that are easily spied on by other users on the same Wi-Fi network.

