Lennük

A Practical Application of Blockchain in the Travel Industry

In this company, we aim to use blockchain technology to enhance a fair and equitable travel distribution market and also to increase the overall efficiency of the travel industry.

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Abstract

The discovery of blockchain technology has allowed more uses for it every day. Lennük is a blockchain-run, data transferring/storage network that will reform the way the airline industry is run by ensuring a safe flight data and also improving the effectiveness and quality of air travel. Lennük is presented as an innovative supplier of blockchain solutions for all flight-goers. Smart contracts on the Ethereum Network will allow more straightforward payment processing, along with data transfer between airports and other users. Lennük plans to lead the airline industry's blockchain technological age by fulfilling all needs in the aviation field. Being able to secure sensitive data, improving data integrity through encryption, transferring data smoothly between different companies/airports and securely in real time through automated processes, reducing overall airline operational costs, and improving consumer costs through data analytics, research, and communication that our system allows is what Lennük is set on accomplishing.

Foreword

Over time, the travel industry is controlled by a handful of companies which have created a highly-concentrated market, through the market power and industry politics. They can charge superior margins and, in some cases, merely collect rent. Rent-collection and greater margins inflate the cost of supply, with consumers bearing the artificially increased costs in the long run.

The combined form of the travel distribution platforms allows the intermediaries to have no incentive in using new technologies, but instead, they spend resources on locking their customers into using mostly obsolete systems that were created decades ago.

Current archaic technological solutions encumber innovation and make it difficult for new platforms to come in. Blockchain technology provides a level playing field for all, thereby encouraging a genuinely free and competitive market in travel distribution.

With Blockchain Technology, identity management will be maintained, all MRO will be tracked, ticketing will be tokenized onto blockchain, and keeping track of airline loyalty miles.

State of the Travel Industry

As one of the world's largest economic sectors, travel and tourism have become a massive avenue for job creation, driving exports and generation of capital across the globe.

In 2016, the industry was up by 3.1% while supporting over 6 million additional jobs in various areas. In total, travel and tourism raised a sum of $7.6 trillion (10.2% of global GDP), and 292 million jobs were created in 2016 which is equivalent to 1 in 10 jobs in the global economy. These numbers seen to be increasing for 2017 and the precise data on them is expected in Q1 2018.

Prospects for the travel and tourism sector in 2018 remain promising, and it will continue the leading wealth and employment creator in the global economy. The role of travel and tourism becomes even more significant, as a mechanism for economic development, sharing cultures, peace creation, and building mutual understanding around the world.

Data transfer is the backbone of the Airline industry, and it is supposed to be shared without mistakes, and insusceptible to errors. The whole value chain of the travel business can be defined as every point where air travelers network with operators to move from one location to the other. The points on the value chain include travel agencies who take care of bookings and reservations, tours airlines, travel operators, hotels, online travel platforms, airport and changeover terminals, travel card providers, immigration, government, car rental agencies and more. When transferring data across this value chain, there is an unavoidable change of hands, and the veracity of this data determines the realization of the industry as a whole. The need for data integrity cannot be overemphasized, as even a slight alteration can result in safety and mishap issues and eventual loss of revenue by airlines. When the data transfer process is compromised, any problem that exists with the passenger and crew management can put the operational value chain at risk. For this reason, smooth data exchange is simply of the utmost importance.

Noteworthy inefficiency is a problem faced by nearly every sector of the travel industry. Individual travel companies are out of date in their use of technology: most travel companies still bank on the use of fax machines and phones as primary means of communication, while others are making efforts to connect to data sources to power their sales.

The concentrated and centralized state of travel distribution bears a substantial cost on consumers, while poor currency exchange solutions inflate consumer prices. Travel start-ups, which are the primary sources of innovation in the sector, have the more significant share of this problem.

Aviation Market with High Request Growth of Passengers

It was predicted by IATA1 (International Air Transport Association) that passenger demands will be doubled in the next 20 Years. So, it is expected that 7.2 billion passengers will travel come 2035, a near expansion of the 3.8 billion air explorers in 2016. An extra 1.8 billion annual passengers will be observed by 2035, with an overall market size of 3.1 billion.

Online Travel Players

The travel market is controlled mostly by five companies in the travel industry. The two leading Online Travel Agencies (OTAs) are Priceline and Expedia. They are in control of over 95% of OTA market in the United States. Amadeus, Sabre, and Travelport, are the top three Global Distribution Systems (GDS), with 99% combined market share in non-direct inventory in the air arcade.

The focus placed on travel distribution has also been one of the primary reason why these companies continue to make record-breaking revenues with Priceline, enjoying a decade of year-over-year 40% EBITA growth. These prevailing players, however, do not possess the economic capacity to revolutionize because only two significant mediators are involved in the hotel sector and three in the airline sector. Some of these companies still use obsolete mainframe computers and software written with an old programming language.

These companies tend to use their influence in the market to extract rent, as shown recently by the US Airways VS Sabre lawsuit. Sabre was accused of overcharging customers and employing other questionable tactics to generate increased revenue. Concentrated power held by these intermediaries also allows them to tie hotels into rate parity agreements, making hotels legally responsible for providing the OTA with the best rates at all times and causing a breach of contract if they offer direct booking customers a cheaper rate. Rate parity has been ruled anti-competitive and illegal price fixing in Germany, France, Sweden, and Italy.

Although these countries have documented rate parity as illegal, the intermediaries still actively remove hotels that don't provide them with the best rates out of search results.

For a boutique hotel, for instance, distributing inventory can end up being extremely expensive. OTAs charge small hotels up to 25% commission (on the gross rate), often coercing the hotel into a rate parity agreement. This increase in distribution fees pushes hotels to make up for the high distribution cost by increasing room rates, thereby unavoidably creating higher prices for consumers.

Nascent travel startups also have a fair share of their issues, finding it difficult to obtain data from these intermediaries. Negotiations are unnecessarily lengthy and integrations, slow. In the vast majority of cases, the intermediaries simply dismiss requests from new companies with no volume, and this is the case for every new startup seeking entry into the marketplace.

Concentrated Landscape

The densely concentrated shape of the travel industry is terrible for consumers and the industry itself, due to the addition of extra costs during transactions and the reduction of price competition among travel providers.

Three GDS companies (Sabre, Amadeus, and Travelport) dominate the distribution landscape between suppliers and travel agents, selling both leisure trips and business travel. Two online travel agencies (Priceline Group and Expedia Inc.), control online booking through various brands, as well. Google also generates billions each year through travel search advertising and a flight booking engine acquired through its purchase of ITA Software.

Sector suppliers are heavily centralized too. Marriott International, InterContinental Hotels Group, and Hilton Worldwide control a plethora of hotels around the world through a variety of brands. United Airlines, Delta Air Lines, and American Airlines control the bulk of air travel in North America, as well.

Through pricing power, private negotiations, and international governmental inaction, these companies crowd out any new corporations seeking entry into the market and determine the business structure of the global travel marketplace with anti-consumer and anti-competitive behavior.

Security Implications

A well-known implication of customer's data being hoarded by trusted third parties is the security holes that they have to deal with. In 2017 alone, highly secured systems which should be in fact un-hackable such as Sabre and Equifax, have experienced some successful hacker attacks. For one master password to have access to a database that contains millions or even billions of dollars' worth of data, it means there is a fundamental flaw, and sooner or later it will be hacked, sometimes, right from inside the company.

Impact on Innovation

Given the current structure of the global travel market, GDS companies which operate the data connections that facilitate the vast majority of air ticket sales around the world, do not have the incentive to develop, especially with the current structure of the global travel market. Each flight and hotel sold generates money for them while charging travel suppliers for using their platforms and associated technology services.

Outside of these GDS platforms, airlines and hotel chains can increase their profitability using more powerful revenue management and merchandising tools, and provide a better experience for buyers or consumers. For some reasons, the global scope of GDS platforms being the most prominent, these sectors are currently locked into these obsolete and costly systems.

The market power of GDS companies and online booking giants debars the development of innovative new travel distribution solutions. It is difficult for startups to access content on the GDS platforms, or scale to anywhere near the booking volume of the OTAs.

This phenomenon has posed an obstacle to the introduction of a real innovation that will disrupt the current travel distribution landscape.

Members of Lennük team have worked in the travel industry for decades and extensively documented these problems. Many industry professionals agree that real competition between the dominant intermediaries would completely eradicate these issues. The creation of an open platform with a few simple rules to guide data exchange between suppliers and buyers of travel is the solution.

Lennük

Lennük is a decentralized travel distribution network which is on the Ethereum platform. The system connects buyers and sellers through a set of smart contracts and open-source tools in a non-rent-seeking method without taking a transaction fee for profit. Simultaneously, no one central company owns the niche, because participants can govern the platform based on collaborative efforts. The lennük platform seeks to effect the use of blockchain in the airline and travel industry. Optimal efficiency, reduction in data redundancy downtime, enhancement of overall experience for all stakeholders at the level of consummate excellence, and using real-time encrypted data transfer, will be the operation of the airline industry with Lennük.

Overview of Lennük

Lennük offers a decentralized substitute to big travel company distribution with a reduced cost of circulation and an extra packaging flexibility other than traditional platforms. The following features aim to address current issues in the industry and allow for an extraordinary surge of the smooth introduction of innovation in the travel industry.

The lennük team has more than 30 years experience in architecture and programming in the travel space with leading obligatory travel mediators.

We aim to create the next-cohort decentralized travel dais on Ethereum, allowing for a real peer-to-peer economy to enable creativity and innovation in the travel industry.

With Lennük, suppliers will not be charged any distribution fees and only a more or less insignificant transaction fee, will be charged to incentivize miners to give computational power to the network. These costs will be calculated automatically by the blockchain at the period of the transaction and will have no relationship with the total booking price or complexity.

Suppliers can choose whether to set a default referral commission. When an appropriate referral fee is set, any individual who refers a client to the supplier, they will be credited with the referral amount set by the hotel automatically–provided they voluntarily decide to establish one. Hotels are also free to set up individual referral rates for different entities if they so desire. Lennük will be deployed on one (or several) of public blockchains, which guarantees 100% uptime. Lennük is a complete-automated solution which integrates directly with the booking systems of travel contractors.

Transactions made on our platform occur in seconds, determined purely by the period needed for the blockchain to mine a block.

Part of our goals is to develop a state passage on top of a public blockchain, ensuring that participants of the network can make multiple thousands of transactions per second. The travel industry requires this level of speed.

Travel is also all about bundling. Whenever you book a trip, there is often a combination of multiple different segments, so it is not just a flight or a hotel room.

With Lennük, bundling is extremely simple. Whether you have an existing affiliation with a service provider that complements yours, or would like to establish a new one, our platform will help you do so; all that is required is that you both use Lennük.

Participants in the ecosystem can see their partners' performance over time and how a reduction in distribution costs will affect their financial outcome and relationship with travel cohorts.

Lennük's code is an open-source and completely transparent for anyone to study and to suggest any changes needed. It is the first open-source project in the travel space and the first genuinely decentralized blockchain solution.

All travel organizations will soon have to become software companies to keep up with the recent revolution that is introduced to the industry's technological landscape. Both suppliers and sellers of travel have to make use of this new reality driven by technology; this is why engineers build our platform for engineers. Labor cost is the top expense on the P&L of any software company and working with legacy systems impedes the progress of software development tremendously.

The security of the data transacted in our marketplace is our top priority. We use public-key cryptography to ensure that details of a transaction can only be seen by the parties immediately involved.

One of the most critical aspects of Lennük is that it is a public decentralized computing platform with the open unanimity model, as opposed to the consortium model or complete centralization. We are confident that only permission free architecture, where everyone is free to participate in the network, will solve the problems described above.

Lennük facilitates travel distribution in all of its different aspects by making it cheaper, faster, more pleasant for consumers, and more comfortable for new business models to emerge in the travel industry.

For this goal to be achieved, some current business practices and models will have to be removed or radically changed, while some new concepts will finally be given a fertile ground and enough room for their growth.

Lennük, fundamentally, creates an enabling atmosphere for perfect competition among travel suppliers and ensures that ideal information is made available for buyers. This will have a great impact on present market players and create new businesses built on the Lennük platform.

These days, reservation for an international flight involves a multi-currency transaction which can span a handful of countries for a single flight. When booking a trip from New York to Dubai via Emirates, a traveler has to pay the ticket fee in USD, while part of the ticket price will then be exchanged to Durham and be paid with that. The total ticket price also comprises government taxes, airport security charges, bag security charges, passenger service charge, embarkation tax, and many more. A single reservation can encompass more than five currency trades for a simple flight if third-party insurance or a car rental is to be added to the reservation at checkout.

Lennük solves this problem by using blockchain technology to remove extensive currency conversion from the travel booking process.

If a secured public ledger information with biometrics is used, the Lennük application will enable validation of people's identity on the Blockchain. With this, impersonation and forgery through replication of other people's status become impossible. Blockchain technology, coupled with a security protocol, allows foolproof traveler and crew data administration since sharing of information is executed by using an authorized access by individuals whose imprints on the blockchain network are verifiable.

All subsequent changes in the life cycle of an aircraft, from the first purchase to every change of ownership or lease and maintenance event will be traced on the Lennük Application — providing an accurate record of service. Using Blockchain Technology, the Lennük application will transform maintenance from paper binders and complex databases into verifiable data on the blockchain. Also, the app will help the organization to ensure that procurement is legitimate and it can offer a permanent reserve record of all purchase of spare parts on the plane, every time it goes through maintenance schedule. Such documents will endorse time and location of maintenances and also provide information on such things that are involved during maintenance, from the beginning of the aircraft's existence.

The Lennük Application will use the blockchain to tokenize ticket and e-ticket and further dematerialize these tickets for irrefutable sharing of info across several touch point of travel. Through the use of smart contracts associated with the tokenized tickets, airlines will be able to determine the multiple usage preferences, terms and conditions of transactions and sale made by any individual across the value chain, and in actual time, from any point in the world in a secure, efficient and fast structure.

The Nük token shall replace air miles as a currency. Instead of ‘earning’ miles, the Lennük platform will allow customers to buy them using the Nük Tokens, Nük, in the same way, they can exchange currency presently, or could earn them outside flying alone if they choose to be paid in air miles denominated in Nük tokens for services. In traditional loyalty point schemes, travelers often have to wait a long time before they can use their points, and yet are faced with limitations on how they can be spent. By tokenizing loyalty points on the blockchain using the Nük tokens, travelers can get immediate value by redeeming them on the spot. Through a specific user community of partners, they can also use them across a broader range of avenues since these tokens will be traded on exchanges. The Nük tokens will be used in paying for goods and services in a secure and fast way.

A few other uses include -

- Airport Collaborative Decision Making (ACDM)
- Airline Ancillary Revenue Generation
- Management of In-Flight Entertainment
- Fast Insurance and Compensation Management
- Flight Planning
- Chattering Services
- Luggage Handling and Control
- Cargo and Customs Clearing and so on.

How Blockchain Enables Lennük

The Blockchain technology has created numerous opportunities with its decentralized and distributed confirmation infrastructure and algorithm. The blockchain can be used for the exchange of encrypted data, ensuring the sanctity of data management and information circulation. As opposed to current methods of data transfer, this stands as a benefit for the operating costs of transferring data and overall security of data transfer. Blockchain transactions can neither be removed nor edited and are there permanently

to be seen via encryption. This also allows access to a complete ledger, where data and information are sent. Here, it can also be known whether data has been tampered with, though everything is kept anonymous and all the sources of arrival and departure are encrypted. A block of data is saved away to the fixed historical record when the nodes (anyone with a laptop) decide through a consensus algorithm attesting to the accurateness of the data contained therein. This was achieved WITHOUT the need for any centralized right. Smart contracts allow the transfer of data using predetermined parameters and protocols.

This technology has shown much potential in various industries, and our Lennük mission is to re-engineer its use in the airline and travel data management industry. The Lennük project will make sure that the travel industry operates at optimal efficiency, cutting out data redundancy downtime, and ensuring that the overall experience for all stakeholders is enhanced at the level of consummate excellence using real-time encrypted information transfer.

Blockchains are designed to exclude intermediaries. Bitcoin, for example, is a financial platform that does not have one central authority, such as a bank or a government, and Lennük employs the same logic to the travel industry, by using the universal smart contract policy that Ethereum has created to decentralize the world economy.

It should be noted that only open blockchains, which require little or no permission, can ensure fairness and change the balance of power because of private or consortium-governed blockchains, by definition, are not able to give the same level of trust and security.

Under today’s architecture, verification for the travel industry comes at a very high cost. A traveler’s details often pass through many departments from the website where the reservation was made, to the airlines, the payment merchants, airports, government, border control agencies, and others. Hence, verification is not only costly but makes sensitive data prone to data leaks under a centralized system. Blockchain, instead, allows for costless verification.

How Lennük Enables Innovation

Lennük is a set of smart contracts on Ethereum with a Decentralized Autonomous Organization (DAO) governance platform that allows affords the holders of Nük tokens the opportunity to participate in the development of those contracts.

Lennük brings suppliers (hotels, airlines, etc.) and sellers (travel agencies) together in a single marketplace. Providers will put availability and price details into the database, where sellers will not have a hard time finding them. Sellers can then purchase that inventory with immediate payment. All these interactions are designed to be automatic, without human intervention or a central authority charging outrageous fees.

Engineers build the lennük platform for engineers. Our aim is not to build user-facing interfaces for the marketplace. Instead, we encourage the creation of those interfaces by third-party developers to spur competition and increase the quality of these products.

We also foresee existing software products, like travel agent interfaces and property management systems being connected to Lennük. The few exciting challenges that Lennük faces can be divided into two categories: technical and commercial.

In the case of the technical problems, blockchains are still not capable of bearing the load that the whole travel industry requires. The Bitcoin blockchain can only handle a maximum of seven transactions per second, while Ethereum can handle between 10 and 20 per second. The good news, however, is that many people are working on adjusting public blockchains and these improvements are in progress, like Lightning Network (Bitcoin) and Raiden (Ethereum)

Another issue that many bring up is the security of Lennük transactions. Safety is our most important focal point. All transactions will be encrypted such that only the parties that are involved in a particular transaction will be able to see its details.

One of the factors will be enlightening people and organizations in the travel industry on the potential of Lennük platform, as part of the decentralized crypto-economy.

Why Use Lennük?

Lennük was built on the blockchain Ethereum technology. This is why clients have to spend tokens to pay for travel and tourism. Related services such as booking an airline ticket, making reservations and accessing other related services. We are working with multinational online vendors, who will allow Nük to be used for the immediate purchase of tickets. We started doing business in the field of travel & tourism agency by thousands of airlines (IATA's members), including national airlines. We plan to have branches in many countries operating travel and tourism activities of outbound and

inbound services. We predict strong revenue growth (over $1 billion) in 2019 related to airlines booking services. A large volume of passengers will also make payment within Lennük system. Our team has conducted extensive research into payment options, and 90% of the questioned passengers said *"Yes"* to pay by Lennuk instead of other traditional methods.

Nük Token

The Fuel of the Ecosystem

We have expanded the Nük token to be able to accommodate more data than a typical ERC20 token, while still maintaining full compatibility with ERC20 standards since travel companies need to send more information typically handled by smart contracts.

Nük Token

There shall be a total of only 100,000,000 Nük tokens in operation. These will power and fuel operations in the Lennük protocol network application. At the initial stage, only 55,000,000 shall be in circulating supply. Nük will trade in major cryptocurrency exchanges after the audit, and token distribution is complete. The Nük token based on the Ethereum network will be utilized in the Lennük Application for booking and ticketing procedures of airlines, and in transfer of data and value within the system in association with other airline services such as air cargo movement, passenger data transfer, crew management, and aircraft maintenance scheduling, loyalty programmes and so on.

Payment Solution Role

Payment Solutions, especially for travel & tourism industry has great potential and plays an integral role in reaching the primary microeconomic goals regarding employment, economic growth, social development and sustainable economic.

Today, a majority of consumers are facing difficulties regarding payment methods. Money transfer charges are increasing and transaction periods are more extended than before. A new payment system would allow firms, individuals, governments and other economic agents to transfer money on a daily basis without such inconveniences

Therefore, Lennük is building a different payment system. It is designed to facilitate on-demand payment. It is secure, has lower transaction fees than traditional payment

methods, and has faster access, with no restriction of the amount used to purchase any travel & tourism services.

Through Lennük wallet, consumers will make use of multiple devices and can have an intuitive and seamless experience through all applications. Bitair engineers aim to focus on a mobile-first and user-centric design strategy to drive consumer preference for their payment products.

Technicality

For a property management system (PMS1) to be able to write information to Lennük database, it has to have a balance of Nük, Lennük platform cryptocurrency. The users of the platform, like travel agents or front desk managers, do not have to know that what powers the system. It is beneficial for developers, however, to understand how it works behind the scenes.

PMS1 will have to spend a tiny amount of Nük to write information onto the Index contract, and for travel sellers to be able to find inventory from that hotel. This incentivizes miners to participate in the network and does not represent a platform fee.

Let's say PMS1 has a balance of 5 Nüks. A hotel manager would like to make ten rooms in the hotel available from May 1 to May 31 for the price of USD 100 per room per night. One transaction with all that information is dispatched, and along with it a fee of 0.01 Nüks is sent to Lennük. Now the hotel has its inventory on Lennük platform.

A travel agency employee (or customer of an online travel agency) then performs a search on Lennük via software created by software engineers. Let's call them TA1 (Travel Agent 1). It also has a balance in Nük, but the search query is free, so the TA1 balance has not decreased. It is only used when the travel agent decides to book a hotel room for one of their customers. In this case, the correct amount of Nük has to be sent to the smart contract to book a room.

Here is a breakdown of what is being transacted in each step:

1. PMS1: INVENTORY. Data: room availability and price, fee: 0.01 Nüks.
2. TA1: SEARCH. Data: search criteria, fee: none.
3. TA1: PURCHASE. Data: room and guest information, price: 100 Nüks, fee: 0.02 Nüks.

At the end of this series of transactions, the TA1 balance is decreased by 100.02 Nüks, and the PMS1 spent 0.01 and gained 100 Nüks, while Lennük has the record confirming that the travel agency customer has the right to stay at the hotel.

At the same time, 0.03 Nüks went towards the miner that confirmed these transactions by putting them in the next block.

Please note that the fees above are theoretical, the marketplace will automatically calculate the actual fee amounts at the time of the transaction.

TRAVEL AGENCY

HOTEL PMS

The usual concern here is the volatility of the currency. We mitigate that risk by allowing parties to convert Nük to fiat currencies at the time of the transaction

Both PMS1 and TA1 users should now be able to verify that their transaction is successful and the traveler can enjoy her upcoming hotel stay. Lennük Block Explorer is a website where they may see their (encrypted) deals if they know its hash. The website will also have statistics about the platform load, Nük price, and other information.

Lennük DAO and Platform Governance

Lennük DAO smart contract is the issuer of Nük. That is where participants in the marketplace will initially buy tokens. Afterward, anyone will be able to sell and buy Nük at the Nük Exchange.

Lennük DAO has all the logic for token distribution. The most important part of this smart contract will be the logic that will allow Lennük users to create proposals for changing the philosophy of the platform and then vote on them.

The nature of the blockchain does not allow for changing smart contracts, but the platform will have to evolve, the data exchange standards will have to change, and we will need new intelligent agreements for handling other methods of transportation.

The solution is to create new smart contracts and have Lennük DAO store a list of these contract addresses. Whenever there is a need to update one of the intelligent

agreements, a user on the platform that has made at least ten successful transactions will be able to propose for that change with the new smart contract logic, explaining the reason for changes, the data to support it, and other useful details. While other participants of the network will be able to vote on that proposal, and when enough vote is attained for the change, the DAO index will be updated automatically within a predefined timeframe.

Data exchange standards are one of the issues that participants in the Lennük marketplace have to decide on. The current model for developing these rules by the Open Travel Alliance and IATA are too slow by any adequate metric. It took IATA five years to create NDC standard, for instance, which has yet to be adopted uniformly.

Lennük brings the open-source model of working on data exchange standards to the travel industry.

Lennük ICO

The token sale will start on Feb 1st, 2018 and will run for two months until April 1, 2018. The sale of the tokens will be conducted as follows:

100 million tokens will be available for the full two months of the ICO. Tokens bought for the duration of the first week will come with a 50% bonus. Tokens purchased during the 2nd and 3rd weeks will come with a 40% bonus. Tokens bought during the 4th and 5th weeks will come with a 30% bonus. Tokens purchased during the 6th and 7th week will come with a 15% bonus. Tokens purchased during the last week of the ICO will happen without a reward.

There is no hard cap for funds raised during the ICO, but if less than $1 million is raised, all funds will be returned to investors. There will be an internal and external audit of the ICO, and this will run for 2-3 weeks. When the audit is completed, all tokens will be distributed. Participants will receive Nük tokens equal in value to the amount of ETH/BTC contributed. All inquiries on how the market cap price will be set, token distribution, and token distribution can be seen in our Token FAQ Page on lennuk.co.

Token Distribution

Decentralized projects require an unbiased token distribution model. Our objective is to avoid the problem most projects have had in the past: the problem of centralization (the “central banking problem”). Our solution to this problem is not to limit the amount of

generated tokens (and therefore funds raised), but rather limit the amount of funding that the Foundation will receive after the initial $1 million.

The Foundation will also receive a certain number of tokens that will amount to 40% of all issued tokens. For example, if there were 100 Nüks generated, the foundation would issue 40 more Nüks to distribute amongst the founders, advisors, employees, and others.

Category	Percentage	Nük Tokens
Public	**55%**	**55 million**
Foundation	**40%**	**40 million**
Incubator	**2.5%**	**2.5 million**
Bounties	**2.5%**	**2.5 million**

TGE Participants

The excess funds from the TGE stage will be put into a smart contract we call the Market Validation Mechanism (MVM) that will maintain the Nük price floor. This smart contract issue funds to the foundation on a monthly basis, according to the rules described in the Market Validation Mechanism section below.

Market Validation Mechanism (MVM)

The MVM is premeditated to provide authentication to the project. The MVM smart contract comprises a few simple rules:

- It is entirely autonomous (no one can alter it).
- It holds the ETH created by the TGE, more than $10M.
- It will allocate a certain amount of funds to the foundation on a monthly basis.
- It repurchases Nük and burns them instantly; the price equation is below.
- If the project is successful and the token price is higher than the MVM price, the foundation will constantly receive funds from the smart contracts. If Lennük marketplace is not successful, the token price will fall below the MVM price, and everyone will be able to recover their contributions, at least partially, by sending Nük to the MVM, thus draining the smart contract.

• The schedule that the MVM will be operating upon will depend on the number of funds in the contract. If the contract has more than $40 million, it will have a 4-year Nükespan, P=48 (months), otherwise P=24 (2 years).
• The following formula shows the percentage of all the funds that the foundation will be able to claim after the month m.
• *dF=me/Pe*
• With a 24-month schedule, the foundation will be able to claim 0.0177% of all the funds F in the smart contract the 1st month after its initiation.
• The MVM is designed in a way that allows all holders of Nük to recover their contribution, at least partially. Therefore, the MVM Nük price will be:
• *p=(1-dF)*F/T*
• Where T is the number of Nük tokens in existence and Fis the initial amount of funds transferred to the MVM after the TGE.
• As you can see, the price function and the amount of funding that the foundation will receive every month is directly related. It should also be noted that the shape of the price function is a negative exponential; we minimize the risk for contributors at the beginning of the project.

Use of Proceeds

We plan to convert a certain amount of received ETH to other crypto-assets and fiat currencies, subject to approval by our advisors and external consultants.

Vesting Schedules

Lennük Foundation founders and employees will receive tokens on a 4-year vesting schedule with one-year cNükf. The advisory board tokens will vest on a 2-year plan with 6-month cNükf.

Ongoing Information Disclosure

Lennük Foundation will release monthly updates and comprehensive quarterly financial reports.

Roadmap

As the platform grows, Lennük will start the development of state channel for blockchains, explicitly designed for travel, to handle a large volume of transactions. This will bring about search mechanisms and quicker payments, the development of user-facing applications like an application for smartphones that would unlock a hotel door using a confirmed B2B transaction hash, and a commitment to design, develop, produce, and contribute to the development of open-source hardware for the travel industry, like point-of-sale systems, locks, terminals, and more. The roadmap will be viewable at www.lennuk.co/roadmap.

Who We Are

Our Team

Our team has deep expertise in software engineering, entrepreneurship, business development in the travel industry and other fields.

Aleksander Lotman

Aleksander is a software engineer and entrepreneur. Aleksander Lotman is the CTO of Zeppelin Solutions, the leading blockchain security auditing company. Lotman also advises Decentraland, and has previously worked as a Software Engineer for BitPay leading the development of Bitcore. He also developed one of the first apps on Bitcoin providing Proof of Existence and proposed BIP 45 introducing multi-signature wallets on the bitcoin protocol

Aleksander writes about travel and technology, and speaks at travel conferences about blockchain and at blockchain conferences about travel decentralization.

Lucas Van Der Berg

Lucas Van Der Berg is a software engineer and evangelist for Python programming language. He has worked with Fredrich Hendrik on a multitude of software projects in the last 10 years. Van Der Berg is a contributor to Python, Django, and many other open-source projects. He has deep knowledge of the travel industry API ecosystem and

its problems. Van Der Berg is responsible for the development of the open-source data exchange standards and Lennuk libraries.

Fredrich Hendrik

Fredrich Hendrik is a blockchain hacker and a full-stack software developer. He has worked on multiple blockchain related projects for the last three years. Hendrik specializes in decentralized and web applications, bringing a deep knowledge of blockchain protocols. He is responsible for the smart contracts development and security, along with the blockchain integration of Lennuk libraries and services.

Colin Lengyl

For over a decade, Collin Lengyl has been an analyst and consultant focused on emerging technologies and how they impact business practices in the global travel industry. Lengyl is a travel industry veteran, speaker and writer. He consults with the biggest travel companies in the world and governments, including Phocuswright, Expedia, Amadeus, the U.S. Department of Transportation, and many others.

Conclusion

Factors including the anti-consumer behavior by corporations, outdated infrastructure, and the business practices of influential travel companies which can do little or nothing to change the current state of the travel industry, is why the industry urgently needs innovation and decentralization.

Using blockchain technology, Lennük offers stakeholders in the travel industry, a means of distributing their products with perfect competition and reduced costs. This new marketplace will inevitably afford consumers the opportunity to choose among a variety of brands and travel companies, the chance to sell products outside of obsolete, yet profoundly rooted distribution platforms.

Lennük will also make management of identity for immigration issues more comfortable while providing an accurate record of service of all maintenance, overhaul, and repair of aircrafts. We will also use the blockchain to tokenize ticket and e-ticket and further dematerialize these tickets for accurate sharing of information across various touch points of travel and create a new loyalty program for airlines using Nük token.

Owned and governed by its community instead of rent-seeking gatekeepers, Lennük symbolizes a more egalitarian and progressive way for the global travel industry. Join us on our journey to redefine the travel distribution landscape.