Lendo

Detailed and Technical White paper

PARTICIPATE IN THE MOST EXCITING, SECURE AND WELL- STRUCTURED ICO ON THE MARKET

A blockchain platform that enables UK licenced lenders to provide loans secured against crypto assets – to borrowers anywhere in the world!

LENDO

Table of Contents

Executive Summary

- Lendo is a solution-focused platform for the loans, crypto assets trading and exchange markets, providing a complete ecosystem for beginners and advanced crypto asset holders.

- The number of individuals buying cryptocurrencies as an investment is increasing at an extremely rapid speed. As both awareness and acceptance of cryptocurrencies continues to grow, the number of people that desire to become involved in this new digital currency is rising exponentially.

- Bitcoin, Ethereum and the other main digital currencies have shown some explosive rises in value. Therefore, cryptocurrency investors want to buy and hold on to these assets. Selling them is the absolute last thing they desire to do.

- If these cryptocurrency owners want a loan, until now they have been unable to use their cryptocurrency assets as collateral.

- Lendo makes loans available to cryptocurrency owners using their crypto token holdings as collateral.

- Borrowers anywhere in the world can get fiat loans from Lendo.

- Lendo makes it possible for regulated and audited conventional lenders to make a cash loan to borrowers using crypto assets as collateral.

- Lendo opens up a borderless world to regulated UK loan companies with its proprietary blockchain technology.

- With conventional lending, a loan company is not permitted to make loans outside the legal jurisdiction it operates in. This is because it is impossible to control defaults on the loan.

- Loans made using the Lendo platform are secured with end-to-end smart contracts and the crypto collateral is held in the Lendo ultra-secure vault for the period of the loan.

- Lenders have full control over borrowers who default on repayments and repossession of the outstanding amount is literally keystrokes away.

- Lendo has developed a complete ecosystem in which token and cryptocurrency owners can trade on its exchange that is built for both beginners and advanced traders.

- The Lendo debit card enables crypto asset owners to spend their assets in real time

- Lendo's merchant system enables anyone to accept crypto payments online in the simplest and most secure way possible.

Legal Disclaimer

Please read the following notice carefully before proceeding to read this white paper document issued by Lendo, an exempted company incorporated and existing under the laws of the United Kingdom (hereinafter – "Distributor"). This notice applies to all persons who read this document. Please note this notice may be altered or updated.

The white paper does not constitute any relationship (contractual or otherwise) between you (hereinafter – "you" or "Holder") and the Distributor. Acquisition of the Lendo tokens is available only after accepting the terms of the token sale (hereinafter – "T&C").

Acquisition of Lendo cryptographic tokens does not represent an exchange of crypto currencies for any form of ordinary shares of the Distributor and a Holder of Lendo cryptographic tokens is not entitled to any guaranteed form of dividend. Holders of Lendo tokens are only entitled to certain rights as laid out within the Terms and Conditions.

Lendo tokens are not intended to constitute securities in any jurisdiction. This white paper does not constitute a prospectus or offer document of any sort, and is not intended to constitute an offer of securities or a solicitation for investments in securities in any jurisdiction.

This white paper is for information purposes only. The contents of this white paper are not a financial promotion. Therefore, none of the contents of this white paper serves as an invitation or inducement to engage in any sort of investment activity.

Prospective buyers of Lendo tokens should carefully consider and evaluate all risks and uncertainties associated with the cryptocurrencies, Lendo and their respective businesses and operations, the Lendo tokens and the Lendo Initial Coin Offering. Familiarise yourself with all the information set out in this white paper, Risk Notice and the T&C prior to any purchase of Lendo tokens. Ensure that you are aware of all of the potential risks prior to obtaining Lendo tokens. The Risk Statement details all potential risks that you should consider. We recommend that you seek out independent financial advice before engaging in any sort of business endeavour.

Introduction

IoT Banking Services for the blockchain era.

The Internet of Things (IoT) is the next big thing in banking and financial services. It is a network of devices connected through the internet, which receive and send data. In this white paper we discuss how IoT and blockchain technology can bring more value to customers and banking and financial services. The white paper will also look at the future of mortgages, how Lendo is looking at the market, as well as security issues and more.

IoT can basically be categorized as the following:

1. Anywhere
2. Any Business
3. Any Context
4. Any network
5. Any device
6. Anybody

The consumer credit market in the UK alone has enormous potential. British households borrowed a record £31.6bn in 2016 just to purchase cars according to the Finance and Leasing Association.

Bank of England statistics confirm that the total size of the market for personal loans, credit card debt and car loans is £198 billion. Meanwhile the mortgage lending market is a colossal £1.3trillion according to the Bank of England.

A mere 0.1% share of the UK consumer credit market would bring revenues of close to 20 million per year – based on an average APR of just 10% on funds lent to the market.

The Lendo platform, using proprietary software, opens up the personal loan market to allow conventional lenders to accept crypto currency assets as collateral and allows the expansion of the UK loan market to take in the entire world.

As the first lending platform with global reach focused specifically on blockchain and cryptocurrency, Lendo offers investors a unique chance to participate in this rapidly expanding market.

In addition, the development of a Lendo ecosystem connects conventional banking with the crypto currency market adding further profit-sharing potential for investors.

Lendo solves problems

The Lendo team started its work on the platform with the intention of providing solutions to important problems. For them it wasn't enough simply to develop a product; it had to be a product that improved peoples' lives.

There are two key problems that Lendo is the solution to:

Problem 1 – Crypto assets not accepted as collateral

Many people who own cryptocurrency want to hold on to it as a long-term investment. They don't always want to sell it when a short-term need for cash arises, such as paying bills, buying a new computer or a car. If they turn their crypto assets into fiat currency just to make a specific purchase, they are likely to find that when they return to reinvest in a crypto currency, that the price has gone up and they have lost the advantage they had before. But, with regulated loan companies unable to accept cryptocurrency as collateral, they had no choice but to sell their crypto assets. Borrowers had to resort to payday loan companies with exorbitant interest rates, and lenders simply weren't able to satisfy the needs of a whole new market of customers. Both parties needed a solution. Lendo provides it.

Loan companies also had another problem; they couldn't provide loans to borrowers outside their regulatory jurisdiction, because of the legal problems associated with making good on any defaults in loan repayments.

Lendo's crypto collateral solution

Lendo allows people to 'unlock' the value in their cryptocurrency by enabling them to leverage it as loan collateral. Furthermore, Lendo has built a proprietary platform that provides FCA regulated lenders with the technology to accept crypto currency as collateral for a personal loan. In addition, because Lendo uses smart contracts built on the Ethereum blockchain for the loan, borrowers won't have to go through lengthy credit checks; a loan in fiat currency can be agreed and transferred in minutes. Plus, interest rates and fees are considerably lower than for other forms of personal loans. Furthermore, loan companies can lend to holders of crypto assets in any country, because the blockchain has no borders and the smart contract holds good wherever the borrower lives.

Problem 2 - Most ICO tokens only have a single purpose

The majority of tokens on sale in ICOs only have a value based on the success of the company. We know that a significant number of ICOs have failed to meet their soft cap, so token holders got no advantage from buying them.

Lendo's dual use token solution

Lendo has created a 'utility' token that has dual use. Each token provides the owner with a 'profit point' in the net asset value of the company at the end of Lendo's five-year exit strategy, with quarterly audited updates on their value so they can track their investment.

The Lendo token also allows holders to trade the Lendo token alongside other currencies via the Lendo exchange. It provides a simple and secure solution for those who want to actively buy and sell crypto assets, and whilst its user interface is primarily aimed at the beginner, it will also include trading features for the advanced user.

Lendo also has a credit card that makes several types of blockchain assets, such as crypto currencies and the Lendo token, spendable in real time.

Lendo Applications

Lendo's Core Applications

- Lendo's core applications consist of account management tools, the registration and the login processes, security procedures and the password reset mechanism.
- The Lendo Crypto Collateral Vault where borrowers place their currency as collateral for the duration of a loan.
- The Lendo Multi Currency Wallet where users store and manage their different currencies.

Lendo's Supporting Applications

- A payment gateway, which is a merchant tool that helps merchants to integrate cryptocurrency payments into their web-shops.
- An Exchange that supports the most tradable cryptocurrencies and allows Lendo users to place orders, as well as trade and swap funds deposited in the Lendo Wallet.

Lendo core application functionality

- The core application offers Lendo users the following functionalities:

Account management

A. Registering a new account
B. Login into an existing account
C. Logout
D. User profile deletion
E. Configuration security (password change, adding phone number, setting email address, two-factor authentication configuration)
F. Viewing account activity log with Two Factor Authentication (2FA)

Wallet Management

A. Viewing balance in each currency
B. Making deposits
C. Creating withdrawal request

Account management and login process

The New Account registration process
In order to register a new account, the customer must provide the following information:

- A unique email address
- Password with at least 12 characters, including numbers, letters special characters.

After submitting the form, the user must confirm his/her email address by clicking on the confirmation link. The user can't access the account until he/she confirms the email address.

Login into an existing account
Users can choose to go through the authentication process by entering their email address and password. There are a number of ways to prevent malicious hacking of an account by an unauthorized individual:

- If the number of failed authentication attempts exceeds 3 times, the application will request users to submit a CAPTCHA code.
- If there are more than 6 failed authentication requests, the application will send an e-mail notification to the user.
- If more than 10 failed authentication requests are made, the application will block the user's account for 10 minutes.

Account management
Once a user has a registered Lendo account, he/she has access to the following applications:

User information
Users can change their profile details (e.g. email address, first name, last name, profile picture and address).

Lendo Wallet
In this section users can view all their balances in crypto and FIAT currencies. They can also choose to withdraw or to deposit funds. The currency exchange balances, which cannot be withdrawn, are placed in the Exchange orders and also displayed here.

The funds in Lendo are kept in four different kinds of wallets: hot wallets, warm wallets, cold wallets and the ice wallet.

Lendo account holders' main funds are kept in the cold wallet, whilst the funds that will actively be used for transactions are kept in the warm wallet, thus preventing the loss of funds. The hot wallet is mainly used for deposits and temporary storage. The ice wallet is used to store the funds that are placed as collateral for a loan provided by a lender in the Lendo network.

Hot Wallets
Hot wallets are stored on the platform and are used for deposits. These wallets hold funds only for a limited amount of time, while the deposit transactions are being confirmed. After the blockchain transactions are confirmed, the funds are scheduled to be moved to the warm wallet.

Warm Wallets
Warm wallets are stored on a totally separate server that has tight security measures. All communication ports, except for the blockchain synchronization ones, are blocked so that no user has access to the server directly. The wallet's password is encrypted.
Only a limited amount of funds can be stored in the warm wallet.

Cold Wallets
Cold wallets are stored on air-gapped servers in the Lendo secure system. These computers have no Internet connection and our financial managers process the transactions from the cold wallets manually.

The majority of funds are stored in the cold wallets.

Ice Wallets
Ice wallets work in the same way as Cold Wallets. However, due to the fact that the funds are stored as collateral and used as a guarantee for the lender to issue loans, this system has a built-in a 4-signature release of funds procedure.

KYC

For the protection of all Lendo users, specific KYC and AML procedures must be followed.

Using the KYC mechanism allows Lendo to verify users before allowing them to access their accounts on the platform.

A user can check his/her account status in the menu. The account status can be upgraded by completing different KYC levels. Each KYC level comes with different limits and requirements.

To register a new account, the user needs to fill in an email address and his/her full name. The application will send a confirmation e-mail. The user is required to click on the confirmation link before being able to access the account.

The Lendo KYC levels are:

1. Basic
a. E-mail address verification only
b. Allows < $50 trading volume

2. Basic Plus
a. Proof of Identity (submitting an identity document with a picture)
b. Proof of Residency (utility bill or bank statement)
c. Personal Information;
d. This allows a trading volume of < $30,000 per day and
e. Option to withdraw and deposit both cryptocurrency and fiat currency

3. Basic Ultra
a. Video conference with the Lendo compliance team.
b. This allows unlimited trading volume

Anti Money Laundering (AML)

LENDO Platform Ltd is a UK registered company operating the loan system for and on behalf of an FCA regulated and licensed lending company in the UK and must comply with the rules and regulations of the UK. All Lendo's KYC requirements comply with all the relevant laws and regulations of this jurisdiction.

AML tracking on Lendo
The Lendo platform automatically sets the user's country based on his/her IP address. The user can change the country at any time in his/her profile screen. Besides requesting the KYC information, Lendo tracks each user's transactions and data within the platform to comply with the Anti-Money-Laundering (AML) rules

The following mechanisms have been set up to meet with the strictest AML policies:
- Collecting the information about all login attempts and IP addresses from users.
- Screening for and reporting multiple accounts registered by the same user by comparing names, addresses and IP addresses.
- Collecting the trading history, the deposit and the withdrawal addresses from all users.

For enhanced security, Lendo will implement services from CoinFirm, a company that offers AML blockchain solutions. All incoming transactions are screened, and if the receiving users' wallets have ever been involved into any illegal activities, the deposited funds will be rejected. This advanced security feature guarantees a safe trading environment.

User experience on Lendo

Lendo has four elements supporting the user experience:

History
In the history section, a user can view his/her transaction history, including information about withdrawals, deposits, the account security information, etc. The actions in this section are grouped into the following types:

- Accounts: creation, authentication, enabling/disabling 2FA, adding a phone number, changing password / email, upgrading the account KYC level
- Crypto Vault and Loan disbursement
- Internal transfers within the Lendo environment
- Exchanges: creating / completing orders, trading; deposits & withdrawals: viewing the history of deposits, withdrawals and transactions
- Visa or Mastercard transaction history
- Merchant transaction history

Security
The main priority of the Lendo team is the security of the system, protecting users against unwanted and fraudulent activities on their accounts by means of the advanced two-factor authentication and the end-to-end encryption processes. The security sub-module can only be accessed after an additional password confirmation has been accomplished (for security reasons). This sub-module can be used to:

- Edit the user's phone number and the email address (only after the confirmation)
- Change the password
- Activate/deactivate the two-factor authentication (2FA)

Upon the 2FA activation, a user receives a 2FA code displayed in the Google Authenticator mobile authentication app or in an email. The application displays a list of balances for all crypto/ fiat currencies that a user possesses. A user is also able to make deposits and withdrawals from and to his/her account.

Deposit
A user can deposit fiat or digital currencies by pressing the buttons in the wallet bar inside the application. After pressing the Deposit button, he/she can select a fiat or a crypto-currency he/she intends to deposit.

If the user chooses to deposit a fiat currency, he/she will be redirected to several payment options. The possible action flow will be based on the selected payment method. If a user opted for Bank Transfer he/she will be taken to a page, on which the bank transfer details can be viewed and downloaded in PDF format.

If the user has selected a payment gateway, he/she will land on the respective website to complete the payment. After the payment is completed, the user will return to lendo.io for payment confirmation. The confirmation page will inform the user that the payment has been completed and processed.

If a user chooses to deposit a cryptocurrency, he/she will see a pop-up with a wallet address and a QR-code of the payment receiver. The payment can be completed by scanning the QR-code, copying and pasting the address, or simply by clicking on the payment link (if the user's wallet app is installed on the device he/she is using). Depending on the cryptocurrency type, the user's balance will be updated after several confirmations. An email confirmation will also be sent out once the payment is received, indicating that the payment is completed.

A user using the merchant system will also receive funds directly to their Crypto Currency wallets. There is a settings system where the user can choose to automatically exchange all or part of the crypto currency into fiat currency. The user chooses how they want to accept the payments, even if the payment is made in a specific cryptocurrency. The user can also choose which currency the payer will pay in and this may differ from the currency the merchant wants to receive. A user can opt to receive an e-mail notification for each payment they receive in the merchant system.

Withdrawal

Withdrawals from users' balances are enabled in both fiat and crypto currencies. Users can withdraw amounts of any currency (FIAT or CRYPTO) that they own. Withdrawals are processed differently depending on the currency that is being retrieved. Some of the withdrawals are automated and some are manual. The automated withdrawals are enabled for users owning small amounts of crypto.

If the user opts to retrieve a specific fiat currency, he/she must enter his/her bank account details and the withdrawal amount, and submit the withdrawal request. The withdrawal request is then manually processed by the back-office operator, and executed in the web-banking interface.

Withdrawing in crypto is similar: a user completes a withdrawal request, fills in the cryptocurrency address and the amount in the required fields.

Lendo Products

Lendo offers the following products:

- Personal loans using crypto assets as collateral
- Global exchange
- Debit cards
- Wallet and e-wallet system
- Lendo token ecosystem
- Token profit pool
- Merchant system
- IPO – token swap

Lendo Currency Exchange

A digital asset exchange offering maximum security, ease of use and advanced trading features for more advanced users.

A blockchain network powered and totally self enclosed with a 100% emphasis on security. The vast majority of customer deposits are stored offline in air-gapped cold storage. We only keep enough online to facilitate active trading, which greatly minimizes risk and exposure. The trading system is part of the core of the Lendo system and is used by the card system, the crypto e-wallet system, the merchant system as well as the Lendo Vault.

An integrated exchange

The Lendo platform has an integrated Exchange developed to handle both crypto- and fiat currencies. The users can trade currencies directly from their wallets.

The trading pairs on the Exchange are dynamically managed from the Exchange back-end. The Admin will be able to add a new pair, to set up dynamic fees for each individual currency and so on. Users can mark certain pairs as favourites.

For each trading pair, the Exchange displays the following information: The type of currency, the daily transaction volume of the chosen cryptocurrency and the price increase / decrease over the last 24 hours. The Lendo Exchange is based on a separate, independent, customised trading engine. This trading engine communicates with the web-server through an internal API. The trade takes place automatically based on the orders available on the exchange in the real time.

Every trade occurs between two parties: the maker, who places his/her order displayed in the order book prior to the trade, and the taker, who places a matching order or accepts the maker's order.

The Exchange offers both Limit and Market Orders: Limit orders are executed by the engine automatically when the price matches; if the price does not match, the limit order may never be executed if there is no match between the ask and bid; Market orders are executed instantly.

Orders can be filled partially, which means that a single order can be divided into parts and sold to different people (e.g. a sales order of 100 BTC can be split and partially purchased by two buyers willing to buy 50 BTC each).

Credit cards

Our mission is to connect conventional banking services and cryptocurrency through our LENDO card and Smart wallet system. Lendo makes several types of blockchain assets, such as crypto currencies and tokens, spendable in real time when using the LENDO Credit Card.

The system is tailor-made for secure storage of multi blockchain assets and makes it easy for the cardholder to spend the funds, which will be accessible and executable 24/7 at any location that accepts Visa or Mastercard.

The LENDO Card will connect to our smart wallet that allows storage of LENDO tokens, BitCoin and Ethereum. We will also add other currencies and tokens in the future.

Crypto digital wallet

The digital wallet is securely connected to several currencies and the Lendo token as well as the debit card system. The digital wallet will be made with state of the art Cryptography for maximum security. The Wallet will be available as a web solution in our system as well as through apps for iOS and Android. Once a person registers as a user and completes the KYC process in our system, the wallet will be instantly accessible. The digital wallet system will also include fiat currency such as EUR, GBP and others.

Merchant system

Crypto currency is a faster and cheaper monetary exchange for merchants providing any goods or services. Whether online, or in a physical location, using the Lendo merchant system has significant benefits compared to credit card services and other methods of payment.

The plus side to using LENDO Merchant system is that the fees are lower than traditional payment mechanisms, and payments are settled instantly. There is no possibility of charge

back as token and crypto transactions are final and confirmed on the blockchain, which gives merchants the final say on returns and fraudulent activity.

Merchants will be able to choose to convert the crypto currency to fiat currency instantly, or may choose to keep all or part of the payment as a crypto investment.

Lendo's merchant platform aims to bring together crypto currency-friendly businesses and potential clients, facilitating the communication between them for their mutual benefit. In this way, the platform performs the role of a middleman in the massive cryptocurrency adoption, helping customers to spend and to acquire their digital coins all in one place.

The merchant platform is one of the cornerstones of creating a marketplace, which will become an essential part of the Lendo ecosystem. The application has a front-end for the users (authenticated or unauthenticated) to search and filter merchants. Each merchant has his/her own wallet, which is independent of regular users' wallets. The merchant platform includes a crypto payment processor that enables businesses to send and to receive transactions in a large number of cryptocurrencies and accept online payments. This module allows users to create and to configure merchants' accounts. To be able to access this module, a user should select an existing merchant account or create a new one.

One user can own multiple merchant accounts. One merchant account can have multiple users assigned to it under different roles. Each merchant has a general profile that can only be modified at the initiative of the owner or the admin.

A merchant's account is owned by the user who created it. This user automatically becomes the owner of this merchant account. The ownership status cannot be transferred to anyone else, all rights of the merchant account pertain to it.

A merchant can select cryptocurrencies he/she would like to accept for each of the branches (e.g. shops, locations, businesses). Additionally, a merchant can add discount intervals for each cryptocurrency and set the maximum payment amounts. Each merchant has his/her own balance. A merchant, unlike a regular user, can choose to have both fiat and crypto currency account balances, whilst regular users can only hold a balance in cryptocurrency.

Only the owner and the admin are privileged to view and to withdraw balance from the merchant's account. This also means that withdrawals can only be processed to the account balances of the owner and the admin. The transaction summary statement reports all the transactions of the merchant's balance and is available in several formats.

Lendo on Digital Security

Cloudflare

Lendo is a high-frequency financial trading platform. With that comes two clear goals: speed and security. This is a challenge facing most operations dealing with cryptocurrencies, as our users are dependent on being able to trade using the latest prices offered throughout the day. In order to provide a secure and fast service able to provide the needed information at the best speed possible, Lendo has a setup with a series of front-end servers. These front-end servers are the first point of contact for our users. The problem with this kind of setup is the potential spikes of traffic that can occur when the markets experience great shifts in value. This can in turn result in a slow down of network traffic, degrading the user experience. Lendo has, in order to provide a fast and secure service throughout spikes in traffic and other unforeseeable, decided to use Cloudflare's load balancing, thus ensuring traffic is intelligently distributed across the front end servers, and thereby increase network capacity. In the case of a server going offline, Failover will seamlessly route traffic to a healthy server. Combining Cloudflare's load balancing and Failover services ensures high availability and uptime.

Lendo is also planning on using Cloudflare's advanced suite of security features:

- IP reputation from over 6 million sites on its network
- WAF (Web Application Firewall) blocks malicious requests from touching Lendo servers
- DDoS protection - award winning protection from even the largest DDoS attack on the Internet.

Lendo strives in every aspect and manner to make sure that the Lendo Platform stays available and uncompromised.

Long passwords:

Today's passwords are required to be more and more complex. The reason is simple. If your password is too short, it would be simple for a hacker to run a brute-force attack on a website in order to steal someone's password. An example of a recent sadly successful brute-force attack, is the iCloud attack, where several celebrities had their photos stolen and spread across the Internet.

Lendo employs, among other security features upon login, long passwords that must include numbers, capital letters and symbols. Long passwords are harder to crack than short passwords, and by adding extra levels of difficulty by having numbers, symbols, capital letters, and not allowing dictionary words, our passwords are exponentially more secure. The length of a Lendo password is a minimum of 12 characters. The inclusion of special characters and numbers means that each password character can any one of up to 94 readily accessible ASCII characters. This allow for 94^12 possible combinations. That's 475,920,314,814,253,376,475,136 meaning that a brute force attempt to hack a password trying a trillion combinations a second would take more than 250 years to try every combination.

Multi-factor authentication (MFA)

In order to login to Lendo, the user will have to go through a two-factor authentication (2FA). This method of computer access control gives a user access only after presenting a combination of two different components that individually serve as evidence of the user's identity. Only by being able to provide proof of identity through both components is the user granted access.

For our 2FA services, we will use the mobile phone as the primary hardware component. The reasoning is that rather than having each user receive and carry with them a separate item to be used as a hardware identifier, a mobile phone is nearly always with a user, and therefore close at hand. It is imperative that it is understood that we do not use SMS as a verification method in our 2FA, as it is condemned as absolutely not secure. Instead we use push notifications and pin codes, with visual direct messages correlated with our system on the screen.

We are closely monitoring the developments of 2FA using mobile devices, and we are looking into technologies using audio from the room of the computer logging in and comparing that to the audio from the location of the mobile phone, in order to further add a layer of correlative security to this system.

For some services, Lendo will employ MFA for identification purposes, whereas the user will have to provide more than two components in order to identify themselves.

New devices used to access account

Lendo´s user base constitutes a wide variety of people that will use the platform according to their individual behaviour and understanding of the Internet and technology in general. This will mean that any one user might login using a variety of gadgets, computers, mobile phones etc. The Lendo connectivity dashboard will with ease let them get an overview of all devices connected at any one time. Not only that, the dashboard will also let the user view details about when the account was last accessed, and where it was accessed from. On the dashboard, the user can manually disconnect the account for any one of the devices listed as connected. This feature is very useful in case a user has lost a phone, or left a computer open and connected at the office etc.

If there is an attempt to add a new or unknown device to the Lendo account, the user in question will be notified by email and/or push notification that a new device is trying to access and use the account. The user will be asked whether or not the device is to be added to the list of authorised devices.

Not only is this an important security feature. It also nudges the user to be more active in reviewing their account, and thereby take an active part in ensuring that there are no intruders etc. By clicking on the device in question, its IP address, and where it logged on to the account, will be viewable. If it is suspicious, the user can flag it and Lendo will do its utmost to find out more and correlate the information with other incidents.

LENDO

Design Decisions and Service Architecture

Design Decision #1: Survive Failures of Underlying Blockchains
Our architecture does not put any limitations on which blockchain can be used with it. Any blockchain can be used, as long as it provides total ordering of operations (which all blockchains do), but the security and reliability properties are directly dependent on the underlying blockchain. We believe that enabling the ability to migrate from one blockchain to another is important as it allows for the larger system to survive, even when the underlying blockchain is compromised. Our architecture also allows for multiple underlying blockchains and treats blockchains as communication channels that deliver totally-ordered operations; any number of underlying communication channels can work as long as they can individually deliver totally-ordered operations.

Design Decision #2: Keep Complexity and Logic Outside of Blockchains
Many blockchains, like Namecoin or Ethereum, implement both the control logic and the data storage plane at the blockchain level (although they leave open the possibility of using external data stores in the future). We believe that not using blockchains for data storage is necessary for scalability and keeping complex logic outside of blockchains is important for both security and scalability. Nodes on the network should not be required to compute complex untrusted programs just to stay synced with the network. Further, it's hard to introduce new features to blockchains after they've been deployed and gained real-world usage. We introduce the concept of virtual chains that can build arbitrary state machines on top of blockchains without requiring any modifications to the underlying blockchains. The abstraction of total ordering of operations, on top of the underlying blockchains. serves as the "narrow waist" of our architecture and keeps complexity outside of blockchains.

Design Decision #3: Scalable Index for Global Data
Any decentralized network requires an index to the data stored by it. Going back to the early days of peer networks, Napster introduced a centralized index with decentralized file transfer in 1999. BitTorrent started with centralized trackers (indexes) as well and later introduced DHT-based decentralized indexes. DHT-based peer networks are susceptible to Sybil-attacks and have historically been unreliable and hard to scale, especially under a lot of churn. Our security team experienced these problems first-hand as the initial peer network for Blockstack was based on the Kademlia DHT. They introduced a new unstructured peer network, called the Atlas network, that solves a particular case of decentralized storage using peer networks–the case where (a) the data set is small in size and, (b) there is a global list of all indexed items available to the network. In Atlas, nodes maintain a 100% state replica. The unstructured approach is easier to implement, has no overhead for maintaining routing structure and is resilient against targeted node attacks (every node has a full copy of data).

Benefits of the Blockchain Service Architecture

Why would the service architecture of the future use blockchain? In the existing infrastructure, a large application or product consists of a large number of modules, which are almost always developed by different teams, and, even if the teams work within the same bank, they still require a large number of cash flows between different participants in the system and a large amount of agreements and inspections.

It is costly, time consuming, and very likely to result in mistakes, including system errors. Blockchain helps automate the chain of transactions, increasing reliability, transaction transparency and removing inefficiencies and bureaucratic hurdles. It lowers the risk of human mistakes and for many operations completely removes the need for human intervention. This makes Lendo work faster, lowering costs and increasing the market's trust in our transactions.

Finally, Blockchain Service Architecture will allow Lendo to build a product line that fits with the trend of personalisation and to offer unique solutions to its users exactly when they really need it. Blockchain technologies are perfectly suited for this task, as they provide an infrastructure with an open register of immutable operations. Lendo relies on the established technology of open blockchains. Technologies for the creation of private blockchains are currently on their way to becoming established and accepted by the industry. In the future, Lendo will adapt to cater to private blockchains in line with their readiness for industrial application.

We see the current issues with financial instruments from within and we see the many inefficiencies that exist between market participants. Our mission is to provide technological solutions that market participants will like, that will improve upon the current market structure, and that will enable the same people — the same market participants, to interact more efficiently and, above all, more profitably

Digital currency storage

Let's first define a few terms and look at the reality, risks and dangers of storing digital currencies. And then we will describe the Lendo vault in a bit more detail.

Quantum Computers = a problem for current encryptions?
In a normal computer, information is represented by 1s and 0s. In a quantum computer, information is represented by a qubit (quantum bits), that can represent both values at once, in what is described as a wide range of "superpositions" of the two states. Another way of seeing this is a two-dimensional world, versus a three-dimensional world: a three-dimensional world is inherently more complex.

It is important to understand that quantum computing is still in its infancy. Qubits are inherently unstable, and therefore the error rate is today so high that quantum computers are still a dream of the future.

The concern about quantum computers is based on the premise that they will eventually be stable and outperform supercomputers. By using an algorithm named Shor´s algorithm (named after mathematician Peter Shor), that runs on quantum computers, they could break RSA encryption, a tool used to secure the transmission of data on the Internet. This is combined with the potential premise that quantum computing could break the digital signatures used by Bitcoin and other cryptocurrencies. In layman's terms it means that one could forge transactions and steal coins and other securely stored assets. Preparing for such a future is imperative for securing information in the future.

Currently, very few blockchain-based currencies are what one would call Quantum safe. Bitcoin and Ethereum are not Quantum safe. Lendo intends to make its vault Quantum safe not only through the use of robust digital security protocols but through the physical isolation of encrypted data from any network which might present an attack vector.

Types of storage

Cold storage

What is Cold Storage? –Basically, it means a computer in a secure room like a bank vault or similar. The computer should be air gapped, which means that there are no wires or other form of connections going to or from it.

Cold storage would mean that someone would physically have to move funds from the Hot Storage to the Cold Storage and vice-versa using a USB stick, or something similar.

The manual operation between the Hot Storage and the Cold Storage has to be done physically by people and it can be done on an hourly basis, daily basis or weekly basis.

Since it is a physical action required most companies store only part of the funds in cold storage and keep a portion of the funds on hot storage.

Hot Storage

What is Hot Storage? The funds that are stored in the Hot Storage are the funds that are instantly accessible by the clients and the company. We can look at the Hot Storage as the live part of the vault.

Companies like currency exchanges, multi currency wallets and those who deliver Visa and MasterCard services linked to crypto currency are usually running a certain percentage of the funds in a live environment so that their customers do not have to wait to have funds withdrawn from their platforms.

As time goes by, each company gets a better understanding of how much they need to keep in the live environment based on clients' historical usage.

Encryption of keys

Running a Cold Storage is like a vault, the vault and the keys to open it need to be encrypted. One of the elements that needs to be addressed is that the possibility of Quantum computers is not so far away. Most of the encryptions that are available and built today are not safe against those super-fast computers. Most encryptions will be possible to open in a very short time once Quantum Computers are available and therefore it is important to look beyond today's encryption methods.

Beyond Crypto - old school methods

For thousands of years people have been protecting important secrets in creative ways. Some examples of that are the pyramids with traps, secrets and hidden rooms.

Another way to think about old school security is to remember the Indiana Jones movies. In those movies Indiana Jones is looking for treasures that have been hidden for a long time and in his hunt for the treasure he faces a lot of dangers and puzzles.

In building a safe vault for the 21st century it is important to combine the modern world with the old school so that there are elements that are impossible for the computer to solve, or requires extra time to get through, in order to release funds.

Risks

Most “robberies” of banks in modern times have had internal employees taking a major or minor part in the robbery. One example we could mention is Nick Leeson taking down Barings bank; not really a robbery but still relevant in this case. Another example is Jerome Kerivel who ran away with 4,9 billion Euros from Societe Generale. With crypto currency there is also one more element that is important. In the cited cases it is still money that can be traced, most crypto currencies act as a bearer bond, which means that if you hold it you own it and no one knows who you are.

Problems include system access that has to be granted to someone, so you will need online surveillance of everything they do and be able to track their movement inside the system with simple to see logging of their actions.

Risks are also apparent during the development phase of the system. Hardware used, such as hard drives, can contain information or snippets of information that later can be used in an attack, unless measures have been taken to hinder such factors.

The developers that have access during the development process need to be monitored, as well as the source code being developed, so that no backdoors are created to be used at a later date.

Once the system has been developed and deployed, the development team will no longer have direct access, as control will be handed over to the Lendo IT security and operational team.

In case of needed maintenance or updates, where external developers are required, measures will be taken to make sure that they never have direct control of the vault in any manner.

Losing the vault keys

The key, albeit being a sequence and not a physical key, can be lost, or mistakenly destroyed, depending on how it has been stored. Of course, extraordinary measures will be used in order to ensure that this will never happen. But there are numerous stories of such a nightmare turning into a reality.

The Lendo vault is designed to minimize loss in a lost key the scenario. The full vault will never be lost, because through elaborate backup schemes, funds that are initially seen as lost will eventually come back into play.

Why there are real risks without one solution

In order to understand the real risks at hand, it might be useful to utilise some stories that are partially from the real world and partially exemplified by fiction.

President of the USA

The President of the USA is, at the time of his/her inauguration, handed over the Tactical Case, with the keys that can in effect release nuclear weapons on the enemies of the USA. It is a huge responsibility that on some level maintains the equilibrium of the world.

In order to sustain this equilibrium, in case anything happens to the President, a chain of command has been established in order to hand the case and the responsibility over to the next person in line.

In the 2017 TV series, “Designated Survivor”, the chain of command was the basis of the story. As terrorists blew up Capitol Hill, and thereby eliminated nearly 300 people on the chain of command list, they attacked what they assumed was an easy target: The keys to the Tactical Case (and the Presidency). Of course, in the TV series, it turned out that he was not an easy

target, but the plot and scenario illustrates the extraordinary thinking and scope of possibilities that might happen in reality as well as the movies. As the world has seen again and again, real life is often wilder, more imaginative and unreliable than any movie, book or story.

Snowden
Edward Snowden is a well-known person all around the world, after he became one of the world's best known whistle-blowers. We are not going to go into details about whether what he did was good or bad. We will just point out that Snowden, an employee of the NSA (National Security Agency), most likely the place on earth with the best and most stringent security measures, walked out of the NSA facilities in Hawaii with a large amount of classified information. Again, we are not focusing on what information he did take out, but the fact that it is/was possible to bring out data from what must be considered the most secure place for data on our planet.

Bearer bonds - why the keys are everything
In the 1980s movie Beverly Hills Cop, the bad guys have their assets in Bearer Bonds. In short a Bearer Bond is, as its name implies, owned by its bearer. There are no names on them, so as long as you have the bond, it could be exchanged for money etc. Fiat currencies are essentially a particular class of bearer bonds.

It is the same for crypto currencies. If you have the key, you have the money available. So protecting the key is of utmost importance.

The Lendo Vault

We are creating a vault and storage facilities that will be Quantum safe, and not bound to one location so as not to be compromised by force majeure or other factors. It will be built in a segmented fashion, ensuring that no matter what, only part of the vault would be compromised, and could be restored in due time. By not adhering to one specific judicial location, our assets will not be touchable by one authority, and by thinking bilaterally in terms of security, we will add several extra measures of security, be it physical and/or digital.

Now that is an easy thing to say. To ensure that our vault is indeed what it needs to be, we have done a lot of research and employed security experts to make sure that our development of the vault and its underlying security is up to spec. As described above, there are several layers of underlying risks that need to be addressed and covered.

The vault team
Our vault development team consists of people from several areas of expertise. We have two back-end developers, focusing on the servers. We have a cryptography expert, well versed in all areas of cryptography, and especially the need to cater for the imminent arrival of the quantum computer. We have a networking expert with comprehensive knowledge of networking, and the ability to look at the raw datastream in order to spot weaknesses, and implement the right protocols. They work closely with the server team, ensuring efficient and desired communication between all servers, admins etc. We have a system operator who has extensive knowledge of operating systems, their features, what services we can run where, how to compile our code for the desired platform, and what features to use, and which to avoid on the desired platform. They are optimising and monitoring the system at all times.

We will also employ an external security company to do security audits on the vault on a regular basis: this puts us one step ahead of possible perpetrators, as well as be in a position to gain valuable information that will further the development of our services.

The servers

As we have touched upon already, we strongly believe in the need for a decentralised system to store the vault. We will therefore setup several server locations, each in a separate judicial zone. The system will be setup in a way that is easy to manage, as well as impenetrable by outsiders.

Managing the risks

So, are we using cold storage or not? The answer is yes, but we don't rely on it, it's just another layer of security. Instead we believe in our server setup that relies on quantum safe encryption, where the entirety of the vault is split up into several smaller units that can be joined at will through an interface that will address and manage the risk of one person having too much access.

A lot of time has gone into creating the vault and its underlying architecture and levels of security. As we have pointed out, the reality of today's currencies and their potential security problems are not to be taken lightly. Hence, Lendo has undertaken the development of the vault with the utmost level of seriousness, and spared no expense, as not only will it guard users' assets, it will guard our assets and reputation.

Therefore, without, for obvious reasons, the ability to share or divulge the complete blueprint for our vault, one can rest assured, that the Lendo vault is probably the best vault in the world. And through continuous development and research it will stay that way.

Lendo Future Goals

Due to our management team's extensive network of contacts in the conventional world of finance, investment and real estate, LENDO aims to make the token ecosystem as large as possible, meaning that token holders will be able to use the token for as many products and services as possible.

The token will be accepted to participate in tailor-made Investment funds with their main focus in real estate investments. There will be a strong synergy in that area, as it will also be covered by Lendo's structured loan/financing and conventional mortgages division, both for the end user as well as real estate developers.

Lendo Token Sale

Initial Coin Offering

The Lendo ICO will run from March 2018 until June 2018.

The Lendo ICO will issue 1.2 billion Ethereum Lendo Tokens (ELT) for sale during the period of the ICO. The supply is locked.

The ELT Token is organised around a smart contract running on the Ethereum blockchain using standard ERC223.

The price per token is fixed at €0.20 with large bonuses available for early bird investors. The monthly net profit of the company will be distributed each quarter in ETH to all ELT holders pro rata the share of tokens owned.

The Lendo ELT Token

Lendo is a 100% self-funded project that did not rely on any external investments. The new and very expansive curve of its development implies launching a token native to the platform that will provide investment opportunities to people who share the Lendo vision and believe in the project's potential.

The Ethereum Lendo Token (Elt):

- Year Created: 2018
- Total Supply: 1.2 Billion
- Standard: ERC 223

Goals:

- Initial Coin Offering (ICO)
- List ELT On Exchanges After Conclusion Of ICO
- Include Lendo Token as a Native Token On Wallets Supporting ERC223 Tokens.
- Promote a Stable and Increasing Value For ELT.

Ethereum Lendo is a hybrid, peer-to-peer cryptocurrency, that utilises the Ethereum block chain for fast and affordable transactions and is limited to only 1.2 billion fixed units. ELT is not mined. All 1.2 billion units have been minted and will be released over time according to the Lendo marketing plan.

Lendo has created a special profit share system where token holders will receive part of the profits of Lendo on a quarterly basis. This system enables owners of the ELT who own the tokens at the cutoff date to receive profits arising from transaction fees charged by the system for cryptocurrency transactions, Vault Profits, Interest Rates, Exchange fees, Merchant fees and Card fees. The profits are transferred to the token holders' wallets on a quarterly basis.

How the Lendo Platform makes money

The platform generates revenue from these sources:

Loan Interest Revenue

Lendo will receive up to a 50% share of loan interest revenue from the licenced lending network. This will likely be the largest single revenue stream. In addition, under certain circumstances Lendo will derive benefit from any rise in value of crypto currency in the vault.

Withdrawal and Deposit fees

The vault crypto currency withdrawal and deposit fees generate revenue for the platform. However, most of the fees are used by the network to process the withdrawal.

Exchange transaction fee

Lendo utilizes the maker-taker transaction fee scheme, that generates pure revenue for the platform. The fee is charged from both members of the traded pair. The fees begin with 0.2% of the taker and maker's fee, and end at 0.04% derived from transactions.

Payment gateway
The merchant selling goods by means of the payment gateway creates the revenue for the platform. The merchant platform operates on a 0.75-2% fee derived from each transaction.

Card System fee
Small transaction charges and other fees associated with the card will generate a minor revenue stream.

Underlying value of ELT

All tokens entitle the owner to participate in certain benefits, including a profit share, from Lendo Platform Ltd. as outlined in this document. The value of the tokens will naturally be linked to the success of the company. Therefore, the minimum value of the token should always be equal to, or bigger, than the net asset value of the company. In case the value of the company increases, the coins underlying value is also increasing.

Token distribution
The Lendo ICO will issue 1.2 billion ELT tokens for sale during the period of the ICO. The value of the token is fixed at €0.20.

Each token bought is equal to 'one profit point' in Lendo. The returns on an investor's tokens will be worked out on a ratio between an investor's token holding and the total tokens in circulation.

Profits will be distributed to token holders on quarterly basis until Lendo is either sold to a third party or issues an Initial Public Offering (IPO).

Bounty and referral rewards
During the ICO we will give out a bonus as a bounty and referral system to people who are contributing to the growth of the company.

Contributors will get a 10% fee for promoting Lendo and bringing people on board the ICO. That's 10% of the amount the referred buyers bring to the ICO.

This 10% fee will be paid the minute we have proof of purchase and the money has gone into the Lendo account.

This incentive ensures that our strongest supporters are rewarded for helping Lendo to grow and is a key element of the marketing plan.

Distribution of profits

Token holders will receive 30% of the quarterly profit pool. Profits will be distributed to token holders on a quarterly basis in ETH. Token holders will also receive quarterly statements issued by a 'Top 5' auditing firm (e.g. KPMG or PWC) showing the value of their tokens in relation to the company's net asset value.

Listing token on exchanges

ELT will be listed on the major crypto currency exchanges within 30 days.from conclusion of the Initial Coin Offering, with other exchanges to follow.

Some of the exchanges we will initially consider listing with include:

KRAKEN
PLONONIEX
BITREX
LIVECOIN

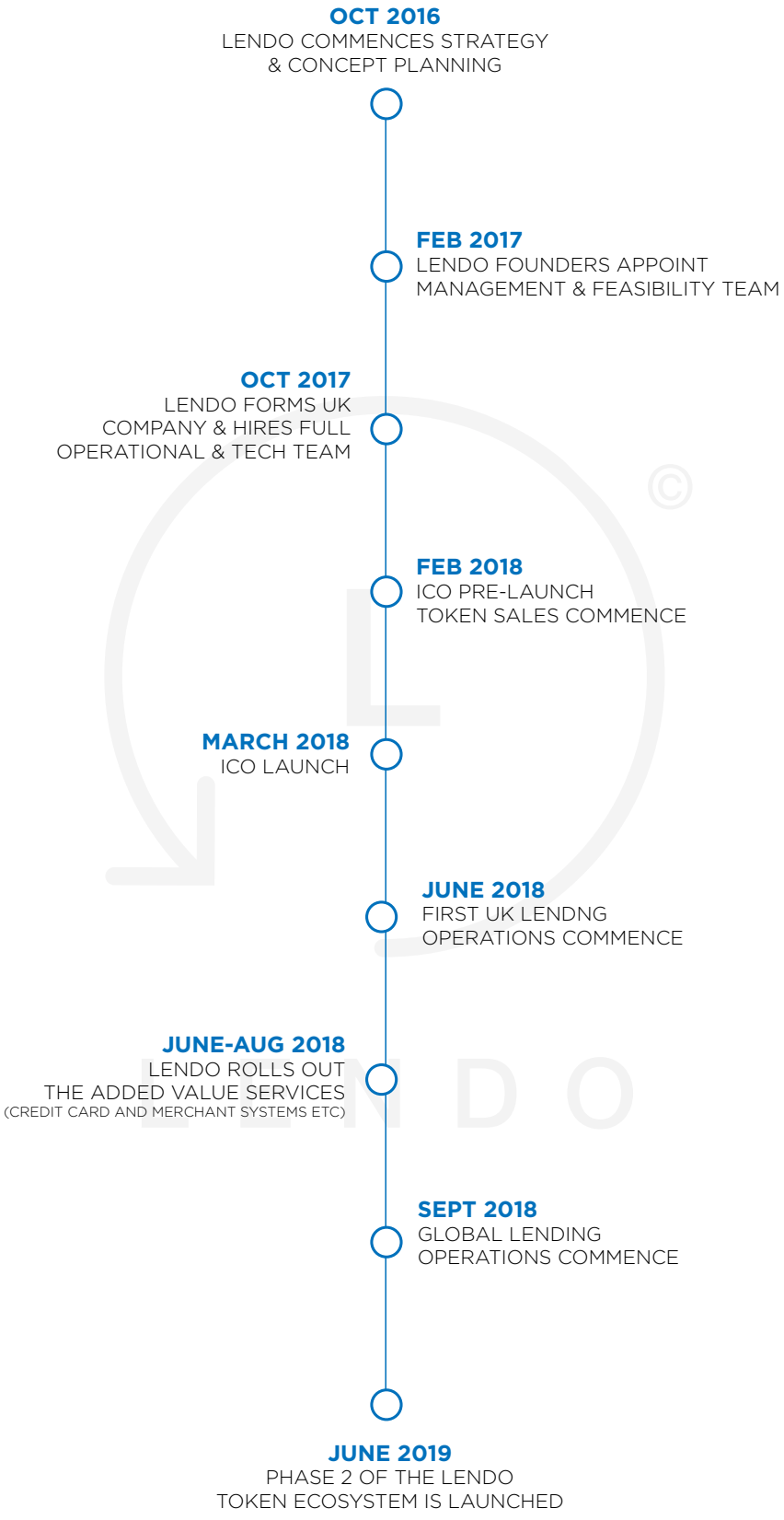
We expect to be listed by coinmarketcap.com as soon as ELT is listed on its first exchange.

Lendo Internal Exchange

An internal exchange will go live from June 2018 onwards enabling token holders to exchange ELT for BTC, $, €, £ and ETH

LENDO

Lendo Road Map



Conclusion

As the first lending platform with global reach focused specifically on blockchain and crypto currency, Lendo gives investors a unique chance to participate in this rapidly expanding market as well as reap benefits from the consumer loan business, which will earn high returns via high interest rates on personal loans. As a token investor you will be able to passively participate in the multi-billion loan and financing industry with an innovative lending platform that partners with licensed and regulated partners in the UK, and which will be extended to the EU and the world.