OXYGEN

#1 DECENTRALIZED CRYPTOREPO PLATFORM

BREATHING NEW LIFE INTO CRYPTO ASSETS

- **Generate income from lending**
- **Raise liquidity against crypto collateral**
- **Borrow crypto assets to go short**

White Paper
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Based on ethereum

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To be regulated in Gibraltar ISOLAS 1892

EXECUTIVE SUMMARY

- Repo markets are the oil that lubricates financial markets; more than $12 trillion repos outstanding in the US and Europe
- Cryptocurrencies are a high growth and rapidly evolving asset class (more than $500 billion market capitalization; average daily turnover over of $13 billion in Bitcoin alone in December 2017). They are gaining mainstream acceptance. A repo market for this asset class does not yet exist
- Market players in crypto assets have very limited options to monetize their holdings or go short. Typically, this requires using the limited inventory held by exchanges. This means investors are price takers and are exposed to the counterparty risk of unregulated exchanges
- Oxygen will breathe new life into cryptocurrency portfolios by helping owners to generate income, enhance yield, take directional views, and hedge. All market participants – from individuals to professional participants (funds, institutional investors, exchanges, broker-dealers) – will benefit
- Decentralization = democratization. Oxygen is a an Ethereum-based decentralized platform that connects all-to-all. It reduces risk and cost, improves returns and liquidity, and adds more choice compared to a centralized model
- Oxygen looks to secure a "liquidity" network effect and high barriers to entry for future potential competitors
- Oxygen aims to serve both B2C and B2B markets. We will use the existing 1,6 million client base of Changelly, a widely trusted crypto exchanger, and then integrate the platform into financial market infrastructure to win broad acceptance among B2B repo users
- Oxygen is regulatory compliant. Oxygen is applying to be regulated under the new Distributed Ledger Technology regime in Gibraltar and aims to register as an Alternative Trading System (ATS) in the US. The adoption of Oxygen's decentralized and regulated repo model by crypto markets can potentially be applied across asset classes
- Oxygen will evolve in line with both new technologies and the regulatory landscape
- Oxygen's evolution will be funded via a one-time token sale of OXG. More than 50% of the proceeds will provide liquidity to Oxygen users. Sale contributions will be accepted in liquid BTC, ETH, and also in other selected ERC20-based tokens to be partially used for market making on the Oxygen platform

TABLE OF CONTENTS

1. THE UTILITY OF REPO MARKETS

Repo transactions are the oil that lubricates modern financial markets with more than $12 trillion outstanding in the US and Europe ($8.8 trillion globally in government bonds alone)[1]. A repo is an agreement to sell securities and repurchase them on a specified future date ("maturity") at a pre-agreed price.

Economically repo can be thought of as a loan secured against collateral, except the collateral is not pledged, it is sold and repurchased at maturity. Ownership gives the Lender greater control over the collateral. Collateral "haircuts" (over-collateralization) and regular margin payments protect the Lender from fluctuations in the value of the collateral. Even if a cash Borrower is declared bankrupt, the Lender can liquidate the collateral without recourse to a court.

Repo markets operate using standardized Global Master Repurchase Agreement (GMRA) documentation and processes. These have stood the test of time, including the Global Financial Crisis (GFC) between 2007 and 2009 and the Lehman bankruptcy. The resilience of repo markets throughout the GFC enabled long-term asset holders to monetize their holdings and avoid undervalued fire sales.

Repos are a meeting point for users of financial markets with various economic needs. Hedge funds and asset managers typically provide collateral in return for cash. Pension funds and corporate treasurers provide cash in return for collateral.

For risk-averse cash investors these features make repos their preferred way of generating additional yield and it has become a widely-used instrument for money market funds and corporate treasurers. It also provides huge flexibility for parties on both sides of the trade.

Figure 1 shows how the conventional repo market works for trades using traditional assets (in this case UK sovereign bonds).

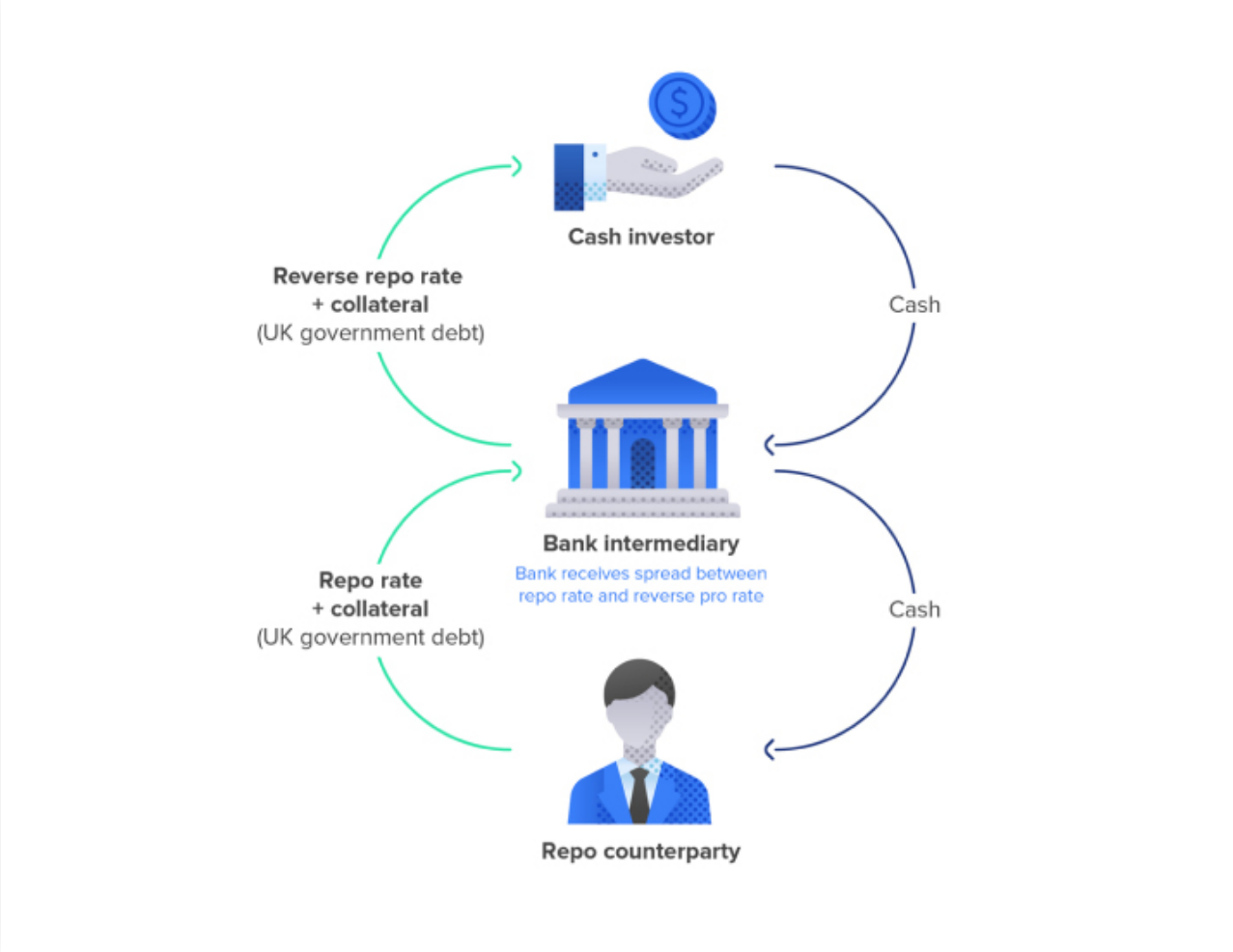


Figure 1: Typical repo trade mechanics

Within the current market practice, the banking system plays a central role, intermediating the transaction between different market actors. This role is being challenged by deteriorating bank credit ratings and shrinking bank balance sheets as the result of new regulations, particularly Basel III.

Peer-to-peer exchanges such as Tradition's Elixium platform, which directly match Lenders and Borrowers, are beginning to gain credibility. However, reaching a critical mass with this new business model, when a well-established and functional market already exists, is difficult. To a large extent, the success of peer-to-peer exchanges depends on available liquidity.

New blockchain-based technologies have the potential to reshape and democratize the existing repo market.

2. NEW ASSET CLASS. NEW TOOLS

2.1. The Cambrian explosion in crypto assets

At the beginning of the movie *The Big Short*, Ryan Gosling's character describes finance in the late 1970s as a "snooze". A client is shown entering a bank to be greeted by an elderly advisor dressed in beige offering an equally drab investment menu consisting of US Treasury bonds and utility stocks. Since then, as the film portrays, the pace of financial innovation has been extraordinary.

In 2017, millions of people sit at their computer screens at home with real-time data at their fingertips that matches any Wall Street trader. They execute trades instantaneously across cash and derivative markets around the world. The equity of a company in some far flung emerging market is more accessible to modern technologically empowered individuals than a US Treasury bond was to the investment advisors of yesteryear.

Digitalization has not only made it easy to access existing asset classes; it has helped create a new asset class – cryptocurrencies. Cryptocurrencies, or crypto assets (coins, altcoins, tokens[2]) are digital assets that use cryptography to secure transactions, control the creation of additional units, and verify the transfer of assets.

The current **market capitalization** of crypto assets is greater than **$500 billion** and the traded volumes are >$10 billion daily in Bitcoin alone. The growth trajectory has been vertiginous. In 2017 the market capitalization of cryptocurrencies has increased by more than 3200%[3].

The creation of Bitcoin was a catalyst for a Cambrian explosion of cryptocurrencies. The 2013 invention of Ethereum – a distributed computing platform for launching decentralized applications – has been perhaps the greatest innovation to date. It has given a creative boost to new decentralized digitalization projects and related tokens. **The sale of tokens (via Initial Coin Offerings or ICOs) has already overtaken early stage venture capital financing for these start-up businesses. In 2017 more than $3,7 billion has been raised.**

Mainstream asset managers, hedge funds as well as banks and financial intermediaries are an emerging force in crypto assets. Mutual fund giant Fidelity, with $2.4 trillion in assets under management, has been an active "miner" of both Ether and Bitcoin[4]. Goldman Sachs, one of the biggest broker dealers in mainstream asset markets, is considering launching a trading business dedicated to cryptocurrencies[5]. Cumberland, a big player in the market, reports a surge of interest from institutional investors and hedge funds[6]. Dedicated crypto asset funds have raised more than $2 billion in assets in 2017.

Institutional demand is driving the creation of new crypto-derivative products; these products will in turn generate greater demand for the underlying assets. In October 2017, the CME Group, the world's largest exchange operator, announced plans to offer futures on Bitcoin by early 2018. Man Group, the world's largest publicly traded hedge fund manager with $103 billion in assets under management, said it plans to add Bitcoin to its investment universe when the CME contract begins trading[7].

Regulators are also starting to take note. Some national regulators, most notably in Japan, have stepped in to bring cryptocurrency trading into line with mainstream asset classes after high profile scandals such as the collapse of Mt. Gox. Switzerland is even building a so-called "crypto valley" in the city of Zug near Zurich where the canton accepts Bitcoin for tax purposes[8]. Gibraltar is in the vanguard of regulating businesses using distributed ledger technology[9].

Taken together, these developments point to an asset class at a tipping point: crypto assets are rapidly entering the mainstream. **Transferring widely used tools such as repos and current best practices from financial markets into the sphere of crypto assets will facilitate the growth and stability of this emerging asset class.**

2.2 CryptoRepo: Repo reinvented

The development of a CryptoRepo market represents a significant advance in bringing the full toolkit of modern finance into the digital age. The increasing diversity of market participants and continued creation of new crypto assets is creating an ecosystem in which CryptoRepo can thrive.

Long-term crypto asset holders need to have an opportunity to lend these assets to earn income. Professional market participants would benefit from borrowing these assets to take or cover short positions (see Figure 2, overleaf, for all key use cases of repos and CryptoRepo and Appendix 1, page 24).

Figure 2. Economic functions (EF) and users of Repo and CryptoRepo

Economic functions (EF) of repo	Users and potential users of Repo and CryptoRepo								
	Banks	Hedge funds	Money market funds	Insurers, pension funds	Long-only asset managers	Corporates	Individuals	VC Funds	Crypto Exchanges
EF1, Low-risk option for liquid assets investment	✓		✓	✓	✓	✓	✓		✓
EF2, Transformation of collateral	✓	✓		✓			✓	✓	✓
EF3, Supporting market efficiency and liquidity	✓	✓		✓			✓		✓
EF4, Facilitating hedging of risk	✓	✓		✓			✓	✓	✓
EF5, Enabling monetization of liquid assets	✓						✓		✓
EF6, Utility usage	✓	✓	✓	✓	✓	✓	✓	✓	✓

However, **options currently available to market participants to borrow or lend crypto assets are limited and risky.** Typically, it requires using exchanges like Bitfinex, Poloniex and their ilk. This means that cryptocurrency holders are often price takers and are exposed to the counterparty risk of largely unregulated exchanges.

There is an opportunity to create a CryptoRepo market based on decentralized technology, without the limitations of legacy infrastructure and benefiting from best practices of the "real" repo market. A new era CryptoRepo market should reduce counterparty risk, integrate both B2C and B2B liquidity, and evolve with the emerging regulatory landscape.

3. OXYGEN: MAKING YOUR CRYPTO ASSETS WORK HARDER

Oxygen is the first CryptoRepo platform.

In a CryptoRepo transaction one party borrows crypto assets from another party and commits to return these assets with interest at a future date. The Borrower provides crypto assets to the Lender as collateral, creating a secured digital transaction (for a detailed summary of a transaction see The CryptoRepo Trade Lifecycle overleaf; for the economics of CryptoRepo see Appendix 1, page 24). It is a safe and fully-collateralized repo solution with transparent pricing negotiated and executed peer-to-peer.

Oxygen will breathe new life into cryptocurrency portfolios. **It will provide an opportunity for a range of market participants to generate income or liquidity, hedge, and take varied investment views.** Individual token holders, intermediaries, and institutional investors will all benefit.

Oxygen is a decentralized peer-to-peer marketplace based on an Ethereum smart contract. It disintermediates layers of expensive market infrastructure such as broker-dealers and banks, custodians and central clearing counterparties. It retains best practices from tried and tested mainstream repo transactions such as the Global Master Repurchase Agreement (GMRA) protocol.

Smart contracts reduce counterparty risk. They act both as a custodian and a clearing and settlement system. Instead of being enforceable by law, smart contracts enforce a contractual relationship by a uniquely determined algorithm.

Oxygen will capture B2C and B2B liquidity and spark a liquidity network effect. Deep integration with Changelly, a leading instant crypto asset exchanger, will secure B2C market participation. Additional APIs and early partnerships with exchanges and wallets will help penetrate the B2B market.

We are building Oxygen to be a safe place to transact from both a legal and regulatory standpoint. This means continuously taking into account various rules and regulations that are developing in real-time with respect to virtual currencies and businesses that involve them. **Oxygen will apply to be regulated under the Gibraltar DLT** (Distributed Ledger Technology) **regime and seek to register as an Automated Trading System (ATS) in the US.**

CRYPTOREPO TRADE LIFECYCLE

- **Users identify themselves and Oxygen assesses the risk of the user's Ethereum wallet address**
- **The Oxygen platform connects Borrowers and Lenders (see Figure 3)**
- **Collateral remains safe and remote — for both Borrower and Lender. In the case of a default, the smart contract offers the Lender a range of liquidation options: access to the collateral directly, or liquidation in exchange for the desired crypto asset via Changelly**
- **Oxygen currency will pay for platform usage — creating a smart contract, close-out, enhanced trade matching and search, reporting, and API**

After a user is registered and has purchased the necessary Oxygen tokens to pay commissions and exchange fees, Borrowers and collateral Lenders can begin trading. The mechanics of CryptoRepo are designed to be intuitive for both current repo traders and new market participants.

The application fields for generating the smart contract are based on the existing GMRA. A Lender creates a requests and specifies the following details: proposed interest rate; the Borrower's rating (e.g. above a specified floor); if multiple Borrowers can participate (split requests); contract duration (maturity); and a hard deadline after which the request to lend expires.

The Borrower provides broadly similar details, such as the proposed interest rate, maturity, request deadline and whether multiple Lenders can participate. However, for the Lender, the key information is the value of collateral assets, list of the assets likely to be used, the proposed haircut (over-collateralization), loan-to-value, and interest rate. One of the few centralized elements of the Oxygen platform, an algorithmic matching engine, then automatically matches request parameters in terms of collateral type, transaction size, interest rate, maturity (duration), and user rating.

After the request is matched, Oxygen creates a transaction in the smart contract between the Lender and the Borrower and charges both parties a system fee.

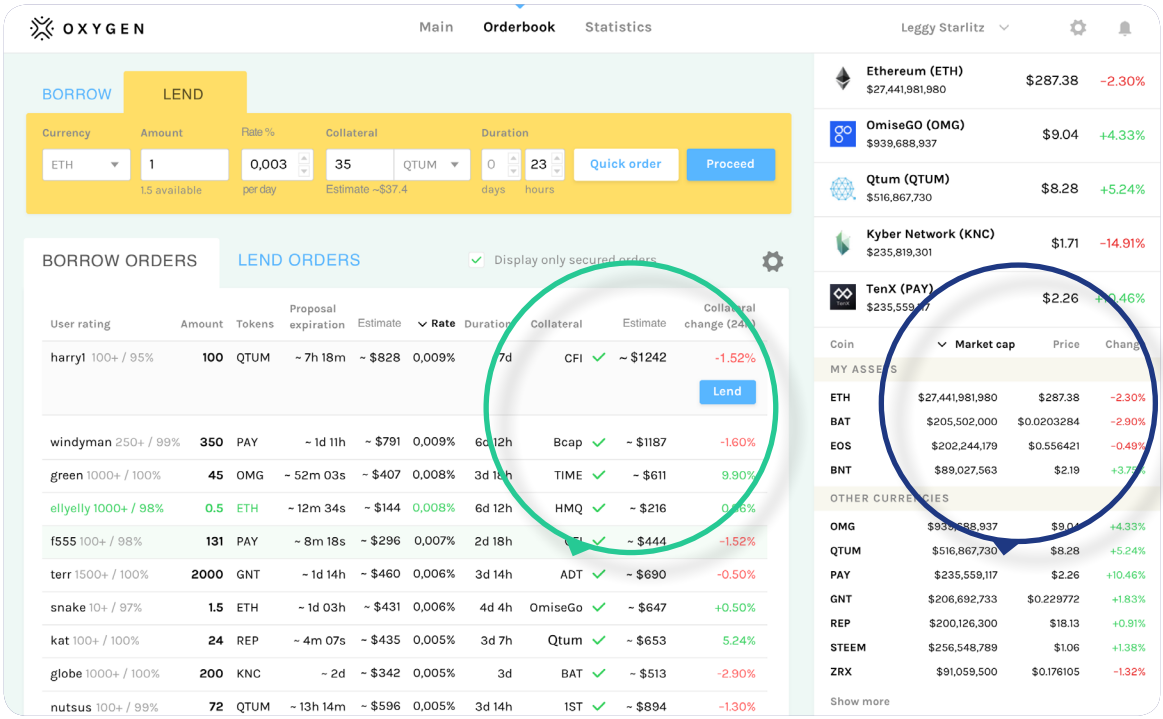
The deal is only concluded once the Lender and Borrower send the respective digital assets to the contract Ethereum address. Ether Gas is included in the system commission fee. The smart contract transfers the loan asset to the Borrower and the collateral is held in escrow.

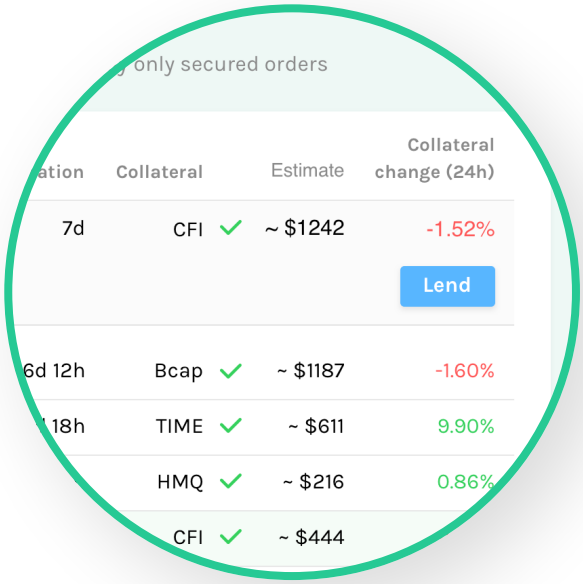
The smart contract will be deployed on the Ethereum platform along with a preliminary audit by Matthew Di Ferrante from the Ethereum Foundation. At the outset of a trade, the smart contract has the following parameters: collateral assets and loan conditions; contract expiration block; and interest rate. The contract anticipates the settlement of the collateral and loan.

The collateral remains remote from both parties until the purpose of the underlying agreement is fulfilled. Both parties are reminded of the terms as the contract expiration date nears. On the contract's expiration date, the contract Borrower returns the tokens plus the agreed interest rate in the currency of the borrowed tokens. The smart contract then transfers the collateral back to the Borrower.

If a Borrower defaults on the loan, the smart contract will unlock the collateral for the Lender. The collateral is either transferred directly to the Lender, sold on the decentralized exchange (e.g. Etherdelta), or exchanged into the needed asset through Changelly or another trusted third-party. In the last instance, Oxygen will charge a system fee in OXG tokens, including gas for carrying out the transaction on the Ethereum platform.

Figure 3. Oxygen Trading Screen





3.1 Leveraging decentralized exchange technology

The Oxygen repo system is largely based on decentralized exchange technology (DEX). It provides reduced risk and cost, increased liquidity and greater flexibility for all participants compared to a centralized model.

A Borrower and Lender settle their assets directly via a smart contract without involving the platform. This removes credit risk of centralized exchanges and puts Oxygen users in control. The DEX model significantly lowers the risk of theft, fraud and data breaches whilst fostering liquidity integration and network effects.

However, full decentralization involves certain risks and costs. On the one hand, money laundering, Sybil attacks or spam could render the platform unsafe and unscalable. On the other, performing all the actions on the network may be too slow and too costly (requiring Gas even for posting orders) to be practicable.

The centralization of parts of Oxygen's platform makes sense from an economic, technical, and regulatory perspective. This is why Oxygen is a hybrid solution – offering decentralized exchange technology with elements of centralization, such as KYC (Know Your Client) and AML (Anti-Money Laundering) checks, trade matching, and community moderation.

3.2 The power of Ethereum and Smart Contracts

Ethereum is an open-source, blockchain-based distributed Turing machine. Turing completeness means that it can calculate anything, assuming enough memory is available. This is important for Ethereum smart contracts because it enables users to implement sophisticated logic.

Oxygen CryptoRepo is a peer-to-peer smart contract hosted on the Ethereum network. This computer code disintermediates expensive and difficult to access market infrastructure. **Smart contracts act both as a custodian and a clearing and settlement system.** Instead of being enforceable by law, smart contracts enforce a relationship by a uniquely determined algorithm in Solidity language.

The smart contract is also the core of transaction processing. Once a repo deal has been matched, Oxygen deploys a record in the smart contract on the Ethereum blockchain network (i.e. pushes the transaction "on-chain"). From that point on, users interact with the smart contract directly using its fixed Ethereum address. The Borrower and Lender settle collateral and loan assets by transferring them to the smart contract address. The smart contract locks the collateral, sends the loan asset to the Borrower's Ethereum address and tracks all ongoing transactions.

The Ethereum network provides reliability and transparency to digitalized versions of standard repo contracts by allowing users to store trustworthy states of transactions within the global blockchain. Smart contract execution does not rely on a third-party at any stage and its conditions cannot be changed without the mutual agreement of the two parties. All private keys of users are held by client-side applications, and the Oxygen platform does not have access to user assets.

3.3 Key components of Oxygen

Oxygen combines web-applications and Ethereum smart contracts. Web-applications help drive centralized services and on-chain transactions. When the Borrower and Lender register their accounts on the Oxygen platform, further workflow engages key system components (see Figure 4).

When users sign up for Oxygen they must go through a **KYC (Know Your Client)** review and AML (Anti-Money Laundering) checks on the platform. As soon as the KYC check is passed users get access to trading which consists of three familiar stages common to all asset classes – pre-trade, trade, and post-trade. At the pre-trade stage, the Borrower and Lender upload their requests to the **matching engine**. Once orders are matched, the trade stage starts and Oxygen sends an on-chain transaction to the **smart contract component** of the platform. At the post-trade stage, a **user's rating component** adjusts the Borrower's rating depending on the trade outcome.

KYC / AML

Oxygen's KYC / AML component is a critical function to prevent fraud and losses due to illegal funds and transactions. It aims to establish a customer's identity and to satisfy the legitimacy of user funds. The KYC / AML component interacts with trustworthy external services in order to check the background of a user (sumsub.com) and to assess AML risk of blockchain addresses related to users profiles (coinfirm.io).

Matching Engine

The matching engine component facilitates matches between loan and borrow orders. It includes a negotiation tool which provides a chatroom for counterparties to negotiate on exact transaction details. Initiating or declining a trade is a mouse click away.

Once users conclude their negotiations and execute a trade this centralized application sends an on-chain request to the smart contract on the Ethereum network – counterparties only have to confirm it with their private keys. It is relatively expensive to push every single order on-chain and this centralized approach significantly reduces transactions costs.

The matching engine will act as a bulletin board for US customers until Oxygen registers as an ATS. The bulletin board will be equipped with a powerful search engine designed to manually, yet easily, find the perfect match for the order using the parameters set.

Smart contracts

There are two smart contracts that Oxygen has deployed on the Ethereum network:

- "Term repo" is a contract with a fixed maturity date
- "Open repo" is a contract without a fixed maturity date. It can be terminated on any date by either party, provided they give notice before an agreed daily deadline

User rating system

The platform will feature a decentralized user rating model. The user rating considers amount of assets held at user's Ethereum addresses and user's track record on the platform. A user's rating increases if a transaction is successfully completed and is downgraded in the case of a default.

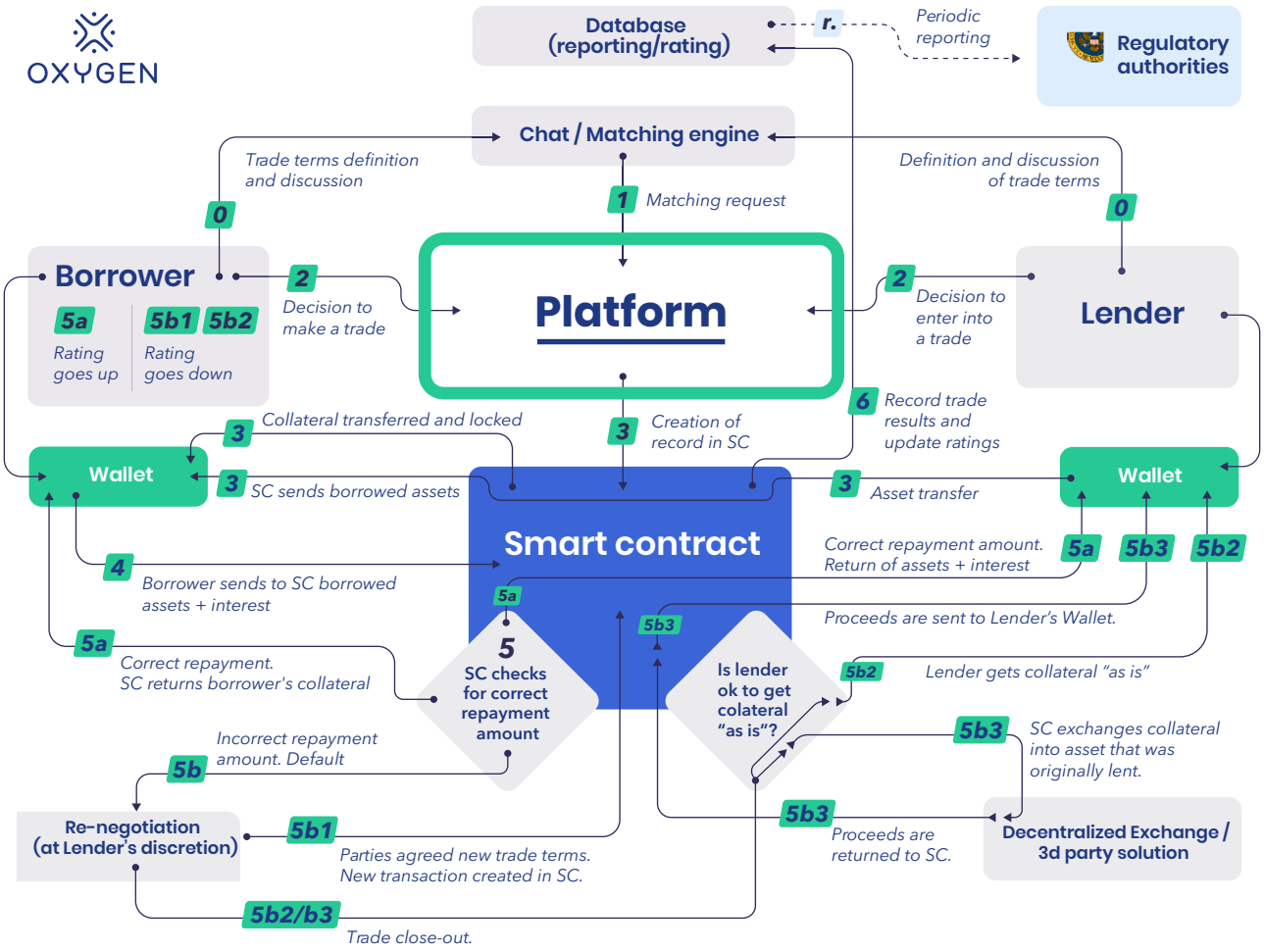
There are other advanced platform components: a risk management toolkit and close-out management system.

A **risk management toolkit** provides:

- Collateral monitoring
- Deal monitoring
- Market risk monitoring

A **close-out management system** can operate in a decentralized fashion via Etherdelta; or via a third-party (such as Changelly).

Figure 4: The Anatomy of a CryptoRepo Trade on Oxygen



Step 0 (pre-trade): Clients access Oxygen with an intention to trade. They utilize the Oxygen Search Tool and chat with other users to establish the broad parameters of a trade including interest rate, collateral, and maturity. Clients publish their requests.

Step 1 (trade): The trade matching algorithm finds the closest equivalent request log on Oxygen.

Step 2 (trade): The matched Borrower and Lender agree the exact details of the trade and execute the transaction.

Step 3 (trade): Oxygen automatically generates a new trade in the Ethereum-based smart contract based on the terms agreed between the parties. Ethereum-based smart contract acts as a settlement system and transfers the collateral tokens from the Borrower's ETH address to self ETH address. The smart contract locks the collateral in escrow and sends the tokens being borrowed from the Lender's ETH address to the Borrower's wallet directly.

Step 4 (trade): At maturity, the Borrower returns the borrowed tokens plus the agreed interest.

Step 5 (trade): The smart contract (SC) checks if it ha eceived the sufficient funds.

5a. SC receives the correct repayment amount. SC returns the lent asset to the Lender's wallet and the collateral to the Borrower's one.

5b. SC does not receive the correct repayment amount. If there is a grace period, SC waits for it to end. If the correct funds are still not there, the Borrower is in Default. The Lender can choose from 3 options.

5b1. Agree new terms for the trade. New transaction is created in the SC. The trade re-starts.

5b2. Receive the Borrower's collateral.

5b3. Request to have the Borrower's collateral exchanged (via a decentralized exchange or a trusted third party) into the asset the Lender lent .

Step 6 (post-trade): The transaction history and parties' ratings are updated based on the outcome of the trade.

R (post-trade, if applicable): Oxygen sends a transaction report if required by a relevant regulatory authority.

3.4 Key smart contract features

The **CryptoRepo smart contract** is the robust core of the CryptoRepo market. It **will be based on the tried and tested "real world" GMRA[10] repo framework** and best practices published by its sponsor, ICMA (International Capital Markets Association[11]). The familiarity of professional users with the GMRA framework will help Oxygen gain traction with market participants and ensure the smooth integration of other (non-crypto) assets in the future.

The CryptoRepo smart contract includes many familiar repo features:

Key terms

- **"Term"** can either be a fixed date or an 'open repo without a maturity date
- **"Initial margin" / "Haircut"**
- **"Interest rate"**

Optional features

- **"Collateral substitution"** to ensure flexibility (mostly for B2B user portfolios)
- **"Manufactured payments"** to help pass through any payments during the course of the trade
- **"Contract amendment"** gives both parties an option to mutually agree on amendments to the existing contract
- **Default management**
  - "Grace period" for non-payment or other default events; can be agreed on from the outset
  - "Cross-default" to protect the Lender from Borrowers with signs of distress
  - "Consultation" to give both parties an option to renegotiate the deal if necessary rather than enter a liquidation scenario

3.5 Oxygen's route to market

Liquidity and deep integration of all market participants into the Oxygen ecosystem are a key part of the roll-out plan. We aim to achieve this by initially capturing B2C market share and integrating B2B players shortly after.

Oxygen has a clearly defined B2C route to market using the distribution power of Changelly[12], one of the leading cryptocurrency instant exchangers. The founders of Changelly have a proven track record of both product development and business plan execution. It aims to build upon its success with Oxygen.

Changelly has been operating since 2015; it processes transactions for 1.6 million users supporting 90 cryptocurrencies. A long-term partnership and continuous integration of Changelly's client base into Oxygen's ecosystem should be the catalyst for a strong liquidity network effect.

We plan to have a convenient B2B API to help integrate the platform deeper into the crypto market, providing ready access to Oxygen for crypto-wallets, exchanges, other aggregators and their clients. We plan to provide both branded and white-label services.

For crypto-wallets, we envision adding a simple "Generate Yield" button for wallet users. For exchanges, we plan to conveniently allow them to generate yield against their inventory as well as help their clients generate yield or funding against their positions.

All market participants will benefit from greater liquidity, new trading opportunities and potential income generation. **Deep integration and concentrated liquidity should create a strong network effect and act a barrier to entry for any new repo platforms that may come to market in the future.**

3.6 Oxygen regulation

We are building Oxygen to be a safe place to carry out repo transactions, both from a legal and regulatory perspective.

Regulators around the world are only beginning to formulate views on what cryptocurrencies are and how to treat businesses involved with them. Currently, there is no EU or UK legislation or regulations concerning the use of DLT (Distributed Ledger Technology) or virtual currencies. Gibraltar is the first jurisdiction in the world to establish extensive regulations for DLT applications.

Oxygen is based in Gibraltar and will apply to be regulated under the Gibraltar DLT (Distributed Ledger Technology) regime coming into effect on 1 January, 2018.

Dealing with US clients is key to Oxygen. This means compliance with US laws and regulations. We are getting advice from top US law firms as to how the platform should be regulated. Some of the critical issues are dealing with crypto assets that may be classified as securities, money transmission rules, broker-dealer/exchange and commodity-related regulations.

If crypto assets involved in a given transaction are treated as a security from the US perspective, Oxygen would need to be regulated as an ATS. For that reason, it is anticipated that US users will initially access the platform via a bulletin board rather than of the trade matching engine. Different functionality will be available for different users depending on where they are residents and the level of their KYC/ AML authorization.

Staying attuned to the evolving regulatory landscape will be a vital building block for Oxygen's continuing evolution.

3.7 Oxygen DFQ

The Oxygen platform will continue to evolve as new technologies become available and adopted by the market.

There are three main developments to look forward to in the near future:

- **Integration of Bitcoin** and other crypto assets based outside of Ethereum blockchain
- Introduction of **margining** and **cross-default** to enhance risk management

3.7.1 Integrating Bitcoin

At the outset, Oxygen will work with Ethereum and ERC20 tokens, the market standard for ICOs. To accept Bitcoin (or any other non-Ethereum based assets) on Oxygen requires solutions that work across different blockchains. Currently, there are no widely used technologies that provide cross-chain solutions. However, the application of the Bitcoin extension Segregated Witness does provide possible solutions to this integration problem. There are three projects which we are monitoring most closely.

Lightning network

Lightning is a decentralized network using smart contract functionality in blockchain to enable instant payments across a network of participants[13]. While still in its early stages, the Lightning network has solid research and cryptographic proofs. It should also be quite straightforward to integrate once user-friendly tools for interacting with the Lightning network protocol become available.

Ethereum-Bitcoin atomic swaps

This is potentially even simpler than the Lightning network, but is much more experimental. Ethereum-Bitcoin atomic swaps will allow custom transactions with the value transferred in both networks simultaneously. While still at the active research and security audit stage, atomic swaps offer a minimalistic design and serve for just this dedicated purpose. The relatively long settlement time of Bitcoin will, however, remain unchanged, whereas the Lightning network offers instantaneous settlement[14].

Polkadot

Polkadot is a much more sophisticated technology that allows cross-chain transactions, communication and pooled security. In principle, it should allow the Oxygen platform to integrate any value-holding network as an operating asset for users, not just Bitcoin or Bitcoin-forked assets[15].

3.7.2 Margining

Margining is an essential risk management tool for any repo contract. It refers to the management of additional collateral to maintain an agreed level of collateralization between the value of the loan and collateral assets.

It is critical that the margining process is fair, objective and free from manipulation. Margining typically relies on having objective benchmark prices for assets. These are essential as fair asset values drive the calculation of the amount of additional collateral required to keep the repo trade from defaulting.

We foresee several possible solutions to market data for "fair" margining:

- Use asset prices from EtherDelta, the Ethereum based decentralized exchange. Currently, limited liquidity on the exchange could make prices easy to manipulate.
- Create database where trusted market participants (for example certain exchanges) would contribute asset pricing data directly. An Oracle smart contract would then "cleanse" the data and calculate an official benchmark price that can be used for margining. (TradeBlock.com[16] is doing something similar for Bitcoin with its XBX Bitcoin Index, which is used as reference price for various derivative contracts).

3.7.3 Cross-default

Cross-default is another important risk-management feature frequently used in repo markets for mainstream assets. It ensures that the Lender is protected against the Borrower's deteriorating credit health, as evidenced by the Borrower defaulting on another trade (either with the same or another Lender).

Once a single trade defaults, the repo contract will update its internal storage mapping for the party that triggered the default. From that moment, every trade in which the Borrower involved is a user who previously defaulted, will be in default. This might be limited to the specific crypto asset.

The Oxygen platform will mark those trades as available for closing immediately. Since the Lender can close these trades immediately, they will have an advantage in negotiations with the Borrower, and might choose to renegotiate the trade or accelerate the liquidation of collateral.

3.8. Oxygen tokens (OXG tokens)

OXG tokens will be used to access and use on the platform: to find a match; create a contract; execute and close-out a trade. Deals with collateral using OXG tokens will not be charged a system fee. Oxygen CryptoRepo trades will be available using Oxygen (OXG) tokens from the outset.

The evolution of the platform, such as deep B2B global integration and regulatory future-proofing, will be funded via a token sale. The OXG tokens will be issued during the token generation sale.

Oxygen will be a liquidity provider as well as the platform developer. **More than 50% of the proceeds of the token sale will be used directly on the platform to provide liquidity.** Contributions will be accepted not only in liquid BTC, ETH, but also in selected tokens using the Ethereum blockchain.

Finally, from the outset Oxygen is also keen to secure liquidity and broad asset selection for Oxygen users and will look to add cross-blockchain interoperability.

CONCLUSION

The elderly investment advisor depicted at the beginning of The Big Short would be baffled by the financial complexity the film describes. However, the pace of financial innovation remains relentless. Crypto assets are now at a tipping point as the market deepens and matures.

Trading crypto assets using the power of decentralized applications has the potential to become a major force for disruption in the financial world. A peer-to-peer, all-to-all marketplace that works for cryptocurrencies and applies a hybrid approach, can also be relevant to the broader financial world in the future.

Oxygen's CryptoRepo platform is a revolutionary first step. It is a pioneering application for owners and traders of crypto assets. This unique and evolving solution is already embracing the future by combining the best practice of mainstream financial markets with two of the most significant innovations of 21st century – digitalization and decentralization. It brings the utility of repo to an emerging investment community in a form that can be applied to any asset.

At Oxygen, we are ready for the future.
You are welcome to join us.

For more information please contact:
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APPENDIX 1

Appendix 1: The economics of CryptoRepo explained

Following the ICO of EOS by Block.one in early July 2017 two crypto investors take a very different view of its prospects. Mindy thinks the huge success of EOS is an example of irrational exuberance in the market for crypto assets. Mork, on the other hand, is a true believer. He is long EOS and does not care about where it trades in the medium-term. He thinks the vision of Block.one will be realized in 2018 and the value of EOS will soar.

Via Oxygen, Mork and Mindy start a discussion on how to structure a trade involving EOS. Mindy suggests the following trade to enable her to gain short exposure (expecting the price to fall) to EOS **on 29 July, 2017:**

- Borrowing amount: 1000 EOS (approx. $1750)
- Collateral 50% from EOS tokens USD value
  in XRP (Ripple tokens) on date of deal
- Maturity: 60 days
- Interest rate set at 0.256% in EOS per day (15.4% for 60 day period) for the whole loan (1000 EOS)

The deal is executed. Mindy receives the EOS tokens from Mork turning them into $1750 of cash with the expectation that the price of EOS will fall. EOS tokens hit a price of $1.915 per token on 8 August, exposing Mindy to losses. But the price of EOS then begins to decline. By 22 August it had fallen to $1.30 per token and by 13 September to $0.75.

At maturity (26 September) the price of EOS had fallen to $0.56. Mindy buys back Mork's 1000 EOS tokens for $568.30. She adds the agreed interest rate (154 EOS) with a total value of $190 and puts these EOS tokens in her wallet.

The smart contract on Oxygen is finalized and the EOS tokens are transferred from Mindy to Mork's wallet.

Mindy has booked a profit of $892; this includes the interest payment to Mork and the opportunity cost of freezing her Ripple (XRP) collateral in escrow. Mork has lost $1181 from the move in the value of his EOS tokens minus the interest paid by Mindy ($990.90). However, the beauty of a repo transaction is that Mork is indifferent. He is a true believer in EOS and has increased his exposure from 1000 tokens to 1154. If he is right and the price returns to $1.915, both Mork and Mindy are happy.

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