Jarvis.Exchange
Unlocking decentralization

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"*Even as we enter one of the most disruptive eras in human history, one of the biggest challenges we face is that today's systems and structures still live on, past their expiration dates. We are locked into twentieth-century approaches that are holding back the next big fundamental shifts in human capacity."* From <u>Future Strong</u> by Bill Jensen.

The Jarvis Exchange infrastructure has been designed to circumvent the problems of these legacy systems and unlock the future!

ABSTRACT

When decentralized technologies are applied to personal finance they enable new features and deliver solutions that are not possible with traditional Fintech. Jarvis is designed to drive large scale adoption of these technologies by improving how users can manage their funds, trade, and invest.

Jarvis allows users to build their own financial hub using the Jarvis Exchange Technology Framework. This framework includes licensed centralized and semi-decentralized exchanges with a multiple wallet structure with escrow functions. The technology connects and makes interoperable a network of centralized and decentralized liquidity pools and protocols that enable instant cross-chain and cross-asset class exchanges. This interoperability provides users access to any financial market and a wide range of DApps. Within the framework, user's assets can be stored in a centralized or decentralized way and be utilized as a medium of exchange or of payment, as collateral, or contribute to a liquidity pool. To ensure a seamless experience, the Jarvis technology automates every process needed for exchanges, transfers, trading, loans and payments.

Users can customize their wallet to build the financial hub that best fits their needs. Through user-friendly interfaces users can leverage from the framework capabilities. They can manage their funds and assets, trade and invest on both digital and traditional products. They can link their assets to a payment gateway, lend or borrow money and access DApps to further extend their possibilities. The intuitive user experience is complemented by AI with conversation skills which can prevent users from making mistakes, answer their questions, and help users make better decisions while making it easier to navigate within their personal ecosystem.

The Jarvis exchange technology framework is supported through the Jarvis Reward Token (JRT) which provides holders private access to the Jarvis DAO which purpose includes the distribution of multiple revenue streams among token holders.

1. Introduction

The value that Blockchain and other distributed ledger technologies can deliver is much greater than the value currently being derived from the mere speculation on digital assets. Unfortunately this incredible value is difficult to access by mainstream users who are not as tech savvy in comparison with most cryptocurrency enthusiasts. The systemic lack of user friendly, publicly accessible interfaces to blockchain technologies makes it near impossible for mainstream users to see or use the value the technology can deliver. The result is that most people just see "blockchain" through the viewpoint provided by media about Bitcoin and its speculative bubble. To move the technology from speculation to utility where billions of people will be able to derive direct value from it, requires the development of an entire ecosystem that is driven by a user-centric approach.

1.1. User centric approach

Well established Fintech companies like Acorns, Revolut or Robinhood have fostered a large user base by delivering user-centric onboarding processes, low fees, user-friendly interfaces, and usually having a mobile-first strategy. Their success has shown that with a good user experience, users are ready to embrace new practices and are open to be more connected to their finances. Unfortunately, the underlying legacy systems upon which most of these offerings are built greatly limit options for these applications. It is not possible to buy stock on Robinhood from an Acorns account; neither can one send funds from an N26 user to a Revolut one; nor is it possible to borrow money with Upstart from an Amazon account. Yet all of these scenarios would be possible through the use of various distributed ledger technologies. At their core many "Blockchain" technologies could be considered as being user-centric in the sense that they allow the building of an interoperable financial ecosystem centered around users. Even more amazing are the many use cases that this technology can make possible. This includes giving access to almost all financial services and markets of the world through a single user account.

Being user-centric implies putting all effort towards improving the usability of the technology. It requires automating and unifying the underlying processes on the backend in order deliver a frontend which allows users to derive value from it without effort. The current state of blockchain is the opposite of this due to the many difficult or time consuming processes which need to be performed manually. The current interfaces and many steps result in a poor *Blockchain experience*, which is confining the technology to a "speculative playground". Rather than forcing new users to begin doing things they

are not familiar with, the system should be empowering to all levels of users. This is done by easing the management of private keys. Outdated processes such as writing down the seed phrase for a wallet will not foster large-scale adoption. Several technologies can help to securely store, encrypt, and retrieve users keys in a user-friendly way equal to the user experience of centralized solutions. User-centric also means providing users the choice between the wallet keys being self-managed or managed by a trusted third party. Delegating the storage of the private keys does not necessarily require centralization, as there are many ways this can be done in a decentralized way. Private keys could be broken apart and dispersed across several trustable entities to retrieve them easily in case of loss while remaining highly secured when stored.

At Jarvis, maintaining this user-centric focus has led to the adoption of a progressive semi-decentralized process that sets aside many of the existing narratives regarding decentralization. The Jarvis team has reviewed how it can leverage from both centralized and decentralized components and technology. This interoperability of all systems is vital because it will allow for greater scalability and a smoother path to decentralization through several steps. An additional benefit to this approach is that it helps ensure greater compliance and compatibility with existing legacy financial systems and regulations.

By combining both on-chain and off-chain solutions Jarvis makes available technology that provides a superior experience and greater benefits to users than centralized technology alone. Currently some of the centralized solutions still remain more cost effective for users. However, it is expected that as various scaling and side change solutions continue to improve, the cost and efficiency of these solutions will also improve accordingly and surpass the cost and speed benefits of centralized solutions.

1.2. The Jarvis value proposition

This user-centric approach has driven the whole development of Jarvis. The goal has been to set the user at the center of their financial ecosystem, and to make this ecosystem as easy to use as any centralized application.

On the backend, a centralized and a semi-decentralized exchange will leverage from a network of centralized and decentralized liquidity pools as well as from escrow and collateralization type functions. This technology framework helps Jarvis to facilitate and automate all the complicated and visible processes behind the transfer, exchange, trading, and payment of digital assets. It also helps to simplify private key management to deliver a smooth user experience. This structure will ease a

variety of different types of transactions such as sending Bitcoin to an Ethereum address; exchanging Bitcoin for Apple stocks; trading Forex from a Litecoin deposit; paying a bill with Monero; or accessing a DApp without having the correct amount of required tokens.

On the frontend, most aspects of the underlying technologies will be delivered in a simplified user interface that does not require understanding of how the technology works. An AI with conversational skills will further help users to prevent mistakes and will ease access to features, data, and provides a new way to interact with software.

As a result, Jarvis provides users an easier and faster way to build their own decentralized and interoperable financial hub. With a simple deposit within their wallet, they could immediately access native services such as trading, lending, and external services such as betting, payment and more through partners' decentralized applications.

The future of finance will be split between the evolution of the current centralized system built around traditional actors, and an open-source, distributed, decentralized, automated and tokenized one built around users. Jarvis will be an important player of decentralized finance and will enable everyone to build their own financial ecosystem with a superior value proposition when compared to traditional finance.

2. Exchange architecture

To date there are already hundreds of different exchanges and protocols with new solutions being launched all the time. A new offering might highlight their scalability, security, decentralized structure, the number of assets listed, or their user-friendly interfaces as their value proposition. The Jarvis Exchanges will follow these best practices and even deliver more. It is important to note that this is possible because the Jarvis exchanges and the technology framework have been built from the ground-up because no other exchange was capable of providing the backend and infrastructure needed to fulfill our user-centric vision. Other solutions were not capable of enough flexibility to keep up with the rapidly changing technologies and regulations

While the underlying architecture has been designed without the restraints of the existing financial systems, it is clear that in order to maximize the functionalities, provide the greatest range of assets, and facilitate both technical and legal compatibility with the existing financial systems, there will initially need to be many components which are centralized in nature.

As a result, the Jarvis technology framework provides the seamless interoperability of centralized and semi-decentralized exchanges which are united through a single frontend and interoperable backend. This unique architecture allows users to leverage from various on-chain and off-chain exchanges, protocols, applications and liquidity. This structure also provides users the choice of managing their assets and data in a centralized or decentralized way with just one click.

The centralized exchange will be launched first and will then be followed by the launch of the Semi-decentralized exchange. After both have been launched the two exchanges will coexist at the same time and will share some components like the off-chain matching engine, and features like margin trading. Initially the centralized exchange will provide users more features and functionalities due to its ability to be easily compliant with existing regulations and legacy technology. However, it is expected that as regulations and technologies continue to evolve, the semi-decentralized exchange will acquire more features and traction than the centralized one.

2.1. Centralized exchange technologies

The centralized exchange will be the first part of the framework to be delivered. This was done to facilitate the fiat gateway and to ensure compatibility with existing regulations and legacy financial systems.

2.1.1. On-demand infinite scalability

The ability to provide unlimited scaling is vital. The exchange framework, matching engine, messaging bus, and various components have been built to allow for a primarily decentralized but extremely scalable backend infrastructure. This infrastructure framework allows any part or component of the system to be expanded and provided more resources both generally or specifically. This way the additional resources can be allocated to any specific component such as a matching engine, messaging bus, or they can be allocated based on another parameter such as be pair specific so as to provide additional resources specifically for the for BTC pair, ETH pair etc. depending on the needs.

All parts of the system can also be divided and expanded into sub components. This framework allows for theoretical infinite scalability of all these parts as long as they are provided with the correct hardware resources. The exchange structure has also been designed so that any component can replicate itself and expand the load distribution automatically to other available hardware resources. This scaling structure can be implemented at both macro and micro levels to optimize performance to the highest level through "On Demand Scaling" and planned load balancing. This load distribution structure has also been designed so that key components are located directly with or very near the user and not the exchange to increase security and allow for superior scalability.

2.1.2. Distributed servers and decentralized load resource structure

Other aspects have been designed to further support a network load of tens of millions of simultaneous users. This includes but is not limited to having a decentralized load resource structure where user specific information is stored both by the user on their device as well as on encrypted servers which are distributed around the world with commercially available solutions including Amazon Web Services and Microsoft Azure, as well as decentralized storage solutions. With this distributed and decentralized structure, historical data can easily be made available to the users from "Geo-Local" servers. If the ultimate level of privacy is desired, users can set their data settings to only be stored on and accessed from their own devices.

2.1.3. Matching engine and messaging bus

Current testing has shown the matching engine able to sustain prolonged periods requiring more than 5 million transactions per second. A single messaging bus has easily delivered just under 1 million transactions per second when not optimized and is expected to almost double the capacity after further optimizations are completed. Should any negative performance appear due to reaching a component capacity it is possible to subdivide or create multiple matching engines and/or messaging buses. For example; if it was expected, or needed for the system load to reach 10 million transactions per second it can be easily distributed between additional matching engines. This dynamic scalability can be set to occur well in advance of any limits or closer to when they would be reached.

2.1.4. Wallet structure

Three wallets coexist within the centralized exchange. The *non-custodial* wallet is the main wallet where user's funds are deposited and withdrawn. It can hold both fiat and digital currencies. Funds in this wallet can be moved to the sub-wallets in the exchange structure. Whenever a user would like to trade, funds are automatically moved to the *non-margin* or to the *margin wallet*.

The *non-margin wallet* only allows exchange of crypto, tokens, assets, and stocks with a 1:1 leverage ratio. An exchange consists of directly transferring the ownership of an asset for another one. The majority of the funds held in this wallet are secured in cold storage.

The *margin wallet* allows for the margin trading of digital assets and traditional products such as Forex. A margin trade consists of depositing funds as margin to gain access to a loan – the leverage. The deposit can be done in fiat or any asset and will be locked in a multi-signature escrow to generate a collateral credit utilized for trading.

2.1.5. Escrow type functions for margin trading

Several wallets within the Jarvis ecosystem are capable of providing escrow function to serve several purpose

such as peer-to-peer trading or triggering a loan – referred as collateral credit – used for margin trading as example. Depending on the currency and associated protocol that is being used the way escrow function will work will slightly differ. Locking assets in an escrow can be done directly within the *margin wallet* using a multi-signature transaction (for BTC, LTC etc.), or by using smart contracts connected through API (*Figure 1. 1*) (ETH, NEO etc.), or directly by calling the locking function when the crypto or the token has this features in their code (like EOS).
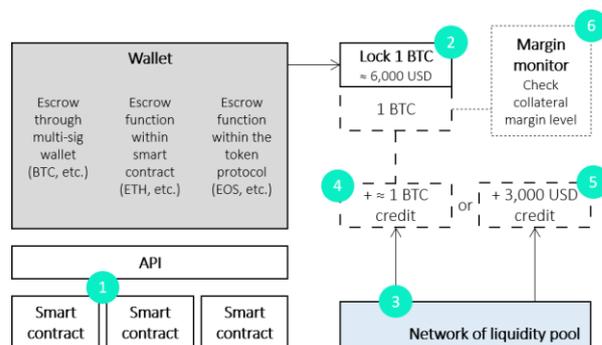

Figure 1. *Process flow to issue collateral credit*

One of the use cases of the escrow type function is to issue collateral credit (*Figure 1.*). When assets are requested to be locked (*Figure 1. 2*), it triggers a collateral credit within the liquidity network (*Figure 1. 3*) for a percentage of the value of the asset. The credit could be issued in the same asset or different asset as the collateral, depending on the needs of the user. The amount of collateral credit and the fees associated may vary according to the liquidity and volatility of the collateral. For example, by setting 1 BTC as collateral, users can get collateral credit in BTC or in USD or others asset, minus a premium fee. They will obtain 1 BTC (*Figure 1. 4*) or up to 50% of the Bitcoin value in dollar (*Figure 1. 5*). To ensure that all loans are always sufficiently collateralized, an off-chain margin monitor (*Figure 1. 6*) is always checking the relative value of the collateral. Should the value of the collateralized asset drop below the required level, the margin monitor will automatically trigger a margin call which could be to end the loan partially or completely. This action will be in accordance with the user's preferences and settings.

When a loan is ended, users will pay back the loan with the designated interest. If the user no longer has sufficient funds to cover the loan amount and interest then a percentage of the collateralize asset will be sold to cover the remaining amount of unpaid interest.
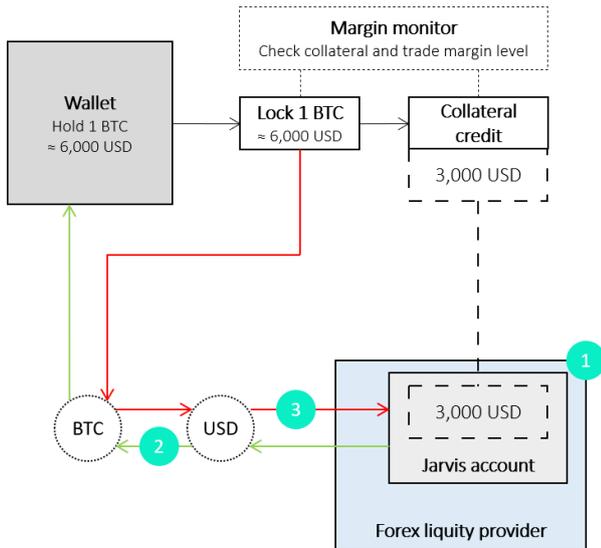
Figure 2. Margin trading on the Forex market.

Regarding margin trading on the Forex market (*Figure 2*), if users cannot or do not want to deposit fiat, they can either sell some assets for fiat, or they can trigger a collateral credit in dollar based on a portion of their portfolio holdings. The collateral credit will be placed within an account opened with a liquidity provider (*Figure 2. 1*). The credit gives the users access to trade Forex with leverage. The available leverage will compensate for a smaller amount of collateralization. If a profit occurs, it will be converted from dollars to Bitcoin and sent to the users' wallet (*Figure 2. 2*); if a loss happens, it would be covered by selling part of the users' Bitcoins for dollar and settling this with the lender (*Figure 1. 3*). The collateral credit process will be automated and simple and make it easy to trade on Forex with any assets. For other margin trading product such as CFD or cryptocurrencies, the mechanism remains the same.

2.2. Semi-Decentralized Exchange Technologies

Essentially the Semi-Decentralized Exchange is a hybrid system which delivers most of what centralized and decentralized exchanges have to offer. The order book technology, matching engine, and several other parts of the centralized structure are reused within the semi-centralized structure but will remain off-chain to ensure the highest performance and lowest fees as well as to facilitate complex and various orders types. With this structure the trade settlement will be on-chain, and users will maintain control of their private keys and custody of their funds and data for increased security, privacy and flexibility. In addition, the semi-decentralized exchange allows for trading without account or KYC in a purely anonymous way.

2.2.1. Wallet structure

The semi-decentralized exchange uses a *custodial wallet* which is a multi-signature capable hot wallet used to manage users' assets in a decentralized way.

Like the *margin wallet* it has an escrow type function which allows to collateralize assets and gain access to collateral credit, but, more precisely, allows peer-to-peer trading.

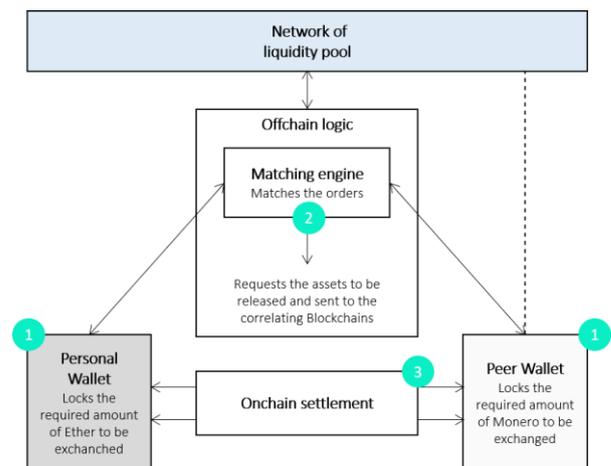### 2.2.2. Escrow type function for peer-to-peer trading

Figure 3. Use of escrow for peer-to-peer trading.

When performing a peer-to-peer exchange, (*Figure 3.*) the *custodial wallet* utilizes the escrow type function. When a user would like to place either a market or pending order, funds will remain in the user's or counterparty's wallet but will become locked (*Figure 3. 1*). The funds will remain in this holding state until a trade is placed and matched by the off-chain matching engine or the user requests the funds to be released back to the wallet when no trade takes place or when a timeout function implemented by the user is reached. Following a trade match, the trade information is sent to the settlement engine which sends the request to release the locked funds from escrow (*Figure 3. 2*) into the correlating blockchain (*Figure 3. 3*). Peer-to-peer exchanges can be done with any assets provided by the liquidity network. Some crypto assets will be able to be exchanged without any KYC, while some assets such as stocks will require the user to have completed KYC.

We will be using some side-chain protocols which allow for the delayed settlement of trading. There are a wide range of use cases when such functionality could be helpful. For example, a trader would like to make multiple trades over a short period of time without having to settle each trade, but rather have one single on-chain settlement for the group of trades. This results in lower fees for the user and less burden on the network.

2.2.3. Collateral credit and margin trading

When margin trading, the wallet is capable of collateralizing assets through the same mechanism described in the centralized exchange. The primary difference between the solutions is the asset custody structure and the requirement for some assets to only be traded by users who have passed a KYC procedure. After completing KYC, users of the semi-decentralized exchange, will be able to trade Forex and a wide range of CFDs.

2.2.4. On-chain settlement

In contrast to the centralized exchange where transactions happen off-chain, the semi-decentralized exchange transactions will be settled on-chain. The blockchains processing time will be improved through side chain or other scaling technologies. Currently there are many scaling solutions being tested on live Blockchain networks which will allow for some creative ways to resolve some of these problems. Solutions such as atomic swaps, the Lightning or Raiden networks, as well as independent scaling solutions such as Bancor, Kyber network, or 0x could be creatively utilized to address liquidity and speed issues. Different blockchains will require the utilization of different scaling solutions and so the result will be a mix of external protocols and scaling solutions working together through the interoperable framework.

2.2.5. Cross-chain exchange

By providing the escrow logic within the wallet it allows users to perform cross-chain transactions between chains that support functionalities such as time locks, smart contracts, multi-signature dependent actions, etc. The settlement engine acts as a coordinator between the different chains and communicates to the wallet when and to whom to release the funds. The funds could be released either back to the user's wallet or to the counterparty. In the future, protocols enabling blockchain interoperability such as Polkadot, Cosmos or the Komodo technology might be used to further facilitate different types of cross-chain transactions.

2.2.6. Enable off-chain trust

To provide trust within the centralized components, an audit of some off-chain components such as the order book will be performed every 30 minutes and published on the Ethereum blockchain. The audit feature will be outlined later in the whitepaper (section 12).

2.2.7. Enhanced Privacy and Security

The primary reasons for some users to select the semi-decentralized exchange compared to a centralized option is that there is not a need for KYC for most crypto transactions and that users are able to retain the keys to their wallet. If a user stays in crypto only mode it is possible to enable full privacy and anonymity. KYC would only be required if the user decides to use the fiat gateway functionality, or to trade on assets on some external liquidity pool that requires KYC like those providing Forex or Stocks (non-tokenized); or to move funds into the centralized exchange.

To further enhance the privacy of this exchange other features such as coin mixing will be facilitated through 3rd party technologies. These features and technologies are already available for many top cryptocurrencies. These matching technologies have often been designed to break apart and restructure trade requests into alternate sizes, match the trades, and then re-structure the trades back into one confirmation for the end user. This and other obfuscation technologies are expected to be utilized as much as possible to allow the users to have a truly private decentralized trading experience. On some protocols and digital assets it is anticipated that this type of technology will not be utilized initially but will be utilized as soon as legally or technically feasible.

3. Wallet framework

One of the key features of the Jarvis technology framework is its wallet structures. There are multiple wallets in order to help reduce risk, comply with various regulations, provide the choice between self and third-party custody of funds and data, and to facilitate features such as escrow and collateralization functions.

3.1. Collateralization functions

Within the Jarvis technology framework, several of the different wallets allow for multi-signature escrow type functions and the creation of collateralized credit for users. The escrow functionality enables peer-to-peer trading as well as margin trading as has been previously mentioned, but this technology can go far beyond these simple use cases.

Collateralization will help eliminate the existing need of specific FIAT or Crypto currency deposits in order to trade most assets or perform a task. The collateralization allows users to leverage from the underlying value of digital assets and utilize them as reserve of value.

Collateralization makes possible the instant transfer of assets in a decentralized way, and provides a very similar user experience as a centralized solution. The use of escrow type functions to deliver the collateral credit allows funds to be instantly exchanged off-chain within the liquidity network.
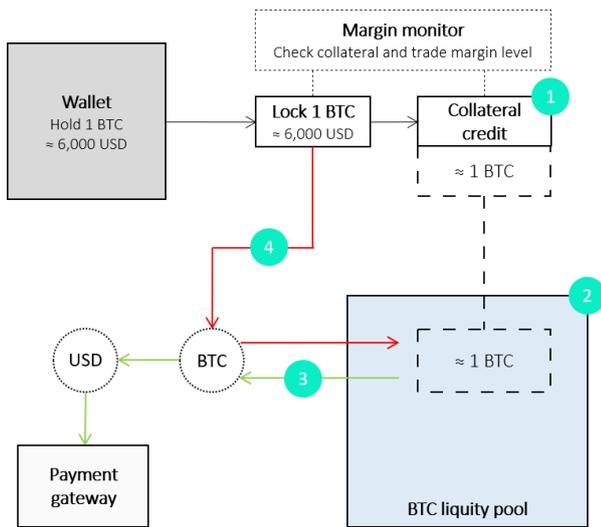
Figure 4. *Payment gateway from custodial wallet.*

Collateralization makes it possible to use instant payment solutions directly in the custodial wallet (*Figure 4.*). Users can trigger a loan (*Figure 4. 1*) within the liquidity network which is connected to the payment gateway (*Figure 4. 2*). The Bitcoin would be immediately exchanged for USD (*Figure 4. 3*) which can then be used in the payment gateway using a debit card or contactless technology on the users Smartphone. Following the initiation of the payment, the Bitcoin will be released from escrow and sent back to the lender (*Figure 4. 4*). This settlement transaction happens on-chain. This feature makes it possible to use any asset to pay anything in Fiat.
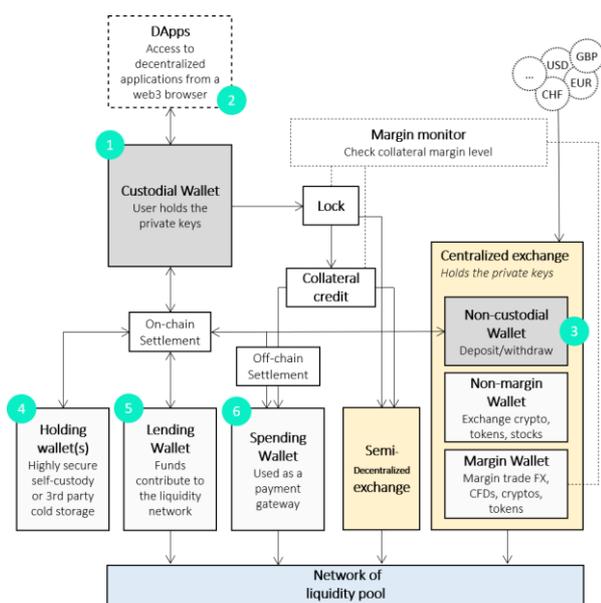
3.2. Multiple wallet structure

Figure 5. *Multiple wallet workflow.*

(*Figure 5.*) Within Jarvis, users can manage their assets in a centralized or decentralized way. According to the user's preference, their funds would be stored within one of two different wallet types; *custodial* or *non-custodial*. A *custodial wallet* (*Figure 5. 1*) can be located on the user's phone, computer, external hardware storage device, or web browser widget like Metamask. This type of wallet gives the user access to the semi-decentralized exchange which will not require KYC for most products and features. This wallet will be integrated with partners Dapps (*Figure 5. 2*) to further extend options and possibilities being provided to the users. A *non-custodial* wallet is the primary wallet type for the centralized exchange (*Figure 5. 3*). This wallet type requires the user to complete KYC and the private keys will be held or managed securely by a trusted third party.

By the mean of a button, users can switch from centralized to decentralized mode and their funds are automatically sent to the respective wallets. Whatever the chosen mode is, users can move their funds to three others wallet which delivers specific use cases.

The *holding wallet* (*Figure 5. 4*) is a highly-secured vault and an alternative to self-managed cold storage. While the highest level of security of funds is generally considered to be for the user to put their funds in cold storage, the holding wallet provides an additional level of security compared to most other wallet options. A user who would like to secure his assets can select from the services of an external partner company to put their holdings in an audited cold storage solution. From a user perspective, it would only require to click a button to move a desire percentage of an asset from any wallet to the holding one. The transfer will be according to the block time and network load.

The *lending wallet* (*Figure 5. 5*) allows users to lock their funds in an escrow to participate in the internal liquidity network; they can choose to lock their funds for the payment gateway, for the margin trading or transaction within the network and will receive several rewards such as transaction fees as well as premium. From a user perspective, they will access to a specific interface where they can loan to the liquidity network and place a desired percentage of their assets. Funds will be moved automatically to this wallet, and the earnings will be sent either in the main exchange wallet or in the personal wallet.

The *spending wallet* (*Figure 5. 6*) will allow funds to be accessible for spending by the Jarvis debit card, partner debit card, or directly on the users mobile phone using NFC technology. This wallet will need to be different from the previous wallets to ensure compliance with existing regulations. This will also allow for the functionality to lock exchange rates for holdings on some blockchains. It is expected that many of the functions and capabilities of this wallet will be greatly

enhanced or supported through collaboration with partners. No action is needed from a user perspective as funds are automatically sent to this wallet when a payment is needed. Transfer between the *custodial* and *non-custodial* wallet to the *spending* one are instant and happen off-chain through the liquidity network.

Despite having multiple wallets, users will be provided with a simplified interface where they can see and manage the combined asset holdings in one place. Advanced users will be able to select an alternate view option where they can see all the wallets separately and to change allocation within different wallets manually.

4. Network of liquidity pool

Many concepts and ideas have driven the development of the Jarvis exchange technologies and framework. Among them is the underlying ideology that a platform should facilitate access to any market or any asset from a custodial or non-custodial crypto wallet. Not only should there be access, but these assets should be exchangeable and usable at any time.

A key component of the Jarvis Exchange architecture is not just one aggregator but multiple liquidity aggregators and matching engines. These components are capable of working together, combining, re-routing, and facilitating a wide range of liquidity solutions. Together they form a network of liquidity pools providing a unique multi-assets offering and facilitate any exchanges of value. This liquidity aggregation solution is not limited to the Jarvis exchanges but will be capable of delivering aggregated liquidity to external parties though our FIX and REST APIs.
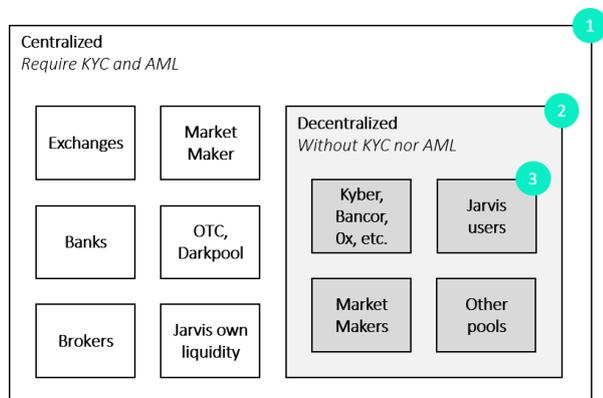
4.1. Liquidity providers

Figure 6. Jarvis liquidity network.

The Jarvis liquidity network (*Figure 6.*) will consist of several connected liquidity providers of different asset classes with various internal regulatory requirements.

The pools are connected through credit line. The Jarvis liquidity network can be accessible by both centralized and semi-decentralized exchange. However, some liquidity providers require that KYC checks have been completed on clients accessing their liquidity. The aggregator technology to allow some of the liquidity to be aggregated externally and other liquidity to be aggregated internally so that the various liquidity pools can meet appropriate regulatory and security requirements. Therefore, some liquidity pools will only be available for users who have passed KYC (*Figure 6. 1*), and others will be accessible to anyone (*Figure 6. 2*).

Among traditional liquidity providers such as others exchanges, market makers and various pools, there are already several crypto token and assets solutions which are helping to create liquidity. These include solutions such as the KyberNetwork or Bancor which make possible the instant exchange of a wide range of Ethereum tokens. The Jarvis Technology framework has been designed to work with these solutions alongside with upcoming scaling solutions such as atomic swaps, blockchain interoperability and lightning network.

In addition to these external liquidity pools, any user, or partner can freely participate in the liquidity network (*Figure 6. 3*) and make their funds available for the short term or long-term use of other users or others liquidity pool. Users will be able to choose which pool they want to contribute to. For example, a user might choose to allocate part of their holdings to the payment pool, to the cross-chain transactions or margin trading one. Each pool will split its revenue among participants proportionate to their holdings. Such actions will be rewarded through ongoing interest payments and premium while also helping to increase the internal liquidity within the network. Another key component of this structure is the ability for external partners to contribute to the liquidity pools indirectly, privately, or anonymously where the regulations allow for such.

Eventually, as much of the liquidity pool holdings as possible will be maintained in offline cold storage. These holdings will be added back to the active liquidity pool should there be increased demand or need.

4.2. Interoperable network

The Jarvis liquidity network will allow a wide range of liquidity pools to seamlessly work together and to be combined with native liquidity to facilitate the instant exchanging of cross-chain and cross-asset transactions and issuing of credit. When a direct exchange between products or assets is not possible, the exchange protocol will coordinate different liquidity providers to perform several transactions to achieve the desired end result.
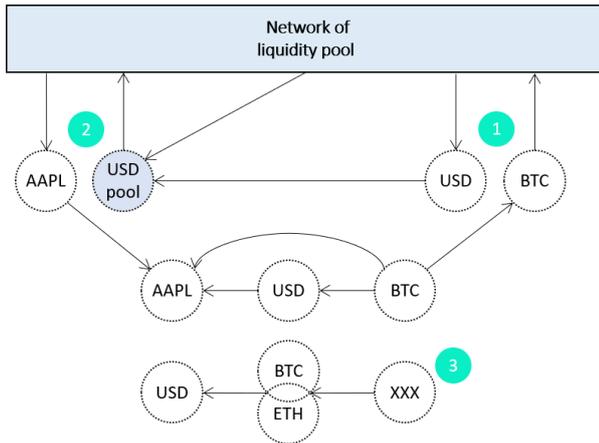
Figure 7. Workflow cross-asset and cross-chain transaction.

A current example of this would be if a user wanted to trade their Bitcoin for Apple stocks (*Figure 7.*). Depending on the volume, the asset liquidity, volatility and the custody of the users funds, various algorithms will determine the associated fees, the exchange rate and how the transaction will be performed to provide a favorable fast exchange. For less liquid assets, the transactions will happen one after another until all parts are completed before the confirmation is provided in order to reduce risk. In the Apple Stock/Bitcoin example, both assets are more liquid and this conversion would be able to happen almost simultaneously. The Bitcoins will be sold against the dollar (*Figure 7. 1*) in one liquidity pool at a locked and lower exchange rate to offer a premium; in the meantime, the Apple stocks will be bought through an aggregated dollar pool (*Figure 7. 2*). Finally, the dollar bought by selling the Bitcoins will be sent to the aggregated dollar pool. While there are multiple steps the transaction time can be near instant when the Bitcoin is settled with a side chain or internal liquidity pool. The same mechanism is used for cross-chain transaction or to exchange any crypto to any fiat (*Figure 7. 3*).

It is expected that some features or levels of interoperability might not be available to all users in all jurisdictions due to regulations or the lack thereof. Jarvis will strive to deliver the highest level of interoperability and availability of functions to all users either directly or through partnerships with existing regulated entities in key jurisdictions such as the USA, Japan, South Korea, and Australia.

4.3. Multi-assets trading and exchange

The first role of the exchange is to provide access to and interoperability between various assets so that they can easily be traded in the centralized exchange, the semi-decentralized exchange or from a crypto wallet.

The first stage roll out of products and services will focus on the crypto exchange which will have top cryptocurrencies such as BTC, BCH, ETH, LTC and USDT. The expansion of products will occur incrementally over the months following the TGE.

Following the launch of the crypto products, other traditional products and markets such as Forex, stocks, commodities, and so on will be enabled. These products will initially only be available to clients who have completed the KYC process. Until the various assets and markets become digitalized, Jarvis will use a mirroring solution which will function very similar to most CFD solutions. This consists of Jarvis opening an account with various liquidity providers and placing identical trades to match the trades placed with Jarvis. This solution has been chosen over creating tokens backed by assets because it has been found to be more scalable, secure and faster to implement at this time. It is expected that this mirroring solution will change over time as other digitization solutions become more available and regulations being to allow for direct digitization of assets.

The current lack of regulatory clarification regarding digital assets is not expected to limit the listing of tokenized assets that will cover a wide range of products including tokenized funds, tokenized real-estate, and digitized versions of traditional products. The vast majority of these assets will be listed through external partners, so most of this offering will rely on other projects successfully tokenizing real world assets. Real estate, artwork, investment funds, and other similar types of assets are more likely to be considered more as long-term investments rather than day trading opportunities and will not be available for margin trading. Despite not being allowed for margin trading these digitized assets will be entitled to be collateralized in order to let users do margin trades based on their holdings. Such assets will also be listed in the market place interface along with TGEs and other traditional investment solutions provided by partners.

4.4. Providing utility and liquidity

The second role of the exchange is to provide ongoing liquidity and exchange functionality for all of the crypto pairs, tokens, or fiat currencies supported within the liquidity networks and protocols. The automatic interoperability of assets provides great value as this facilitates the user experience by automating the steps and making all assets a medium of exchange or payment.

Through its API, the true utility and liquidity of the system can be delivered to the Blockchain ecosystem. Centralized and decentralized financial applications, TGE's, payment solutions, other exchanges and wallets will all be able to directly and indirectly benefit from this solution.

The Jarvis Exchange framework might be seen as an exchange layer which will fit in the technological stack of underlying applications and services layers that will comprise the new Web 3.0. Even if Jarvis currently has enabled some centralized components, they are primarily there to meet compliance with existing regulatory requirements for fiat gateways. Jarvis will strive to eliminate or provide alternative options to the

centralized parts as quickly as solutions become available.

5. User interface and applications

The Jarvis team will initially be launching a mobile wallet focusing on monitoring and payment solutions and a cross-platform multi-assets trading interface called Jarvis Trader. Jarvis trader and the Jarvis wallet have been designed to provide a user-friendly interface for the technology framework behind the Jarvis exchanges. The user-friendly interfaces combined with the interoperability technology solution will directly compete with traditional Fintech applications such as Revolut or Robinhood.

As much as possible, the Jarvis experience simplifies the users interactions with every aspect of the underlying technology. *This section is a quick overview of the interfaces and their features; a more detailed one will be provided in other documents.*

5.1. General concepts

While the two interfaces are targeting different users and will be marketed in different ways, they both contain several common features that makes up the DNA of Jarvis applications.

5.1.1. *Blockchainless* experience

A good user interface solution shouldn't require any difficult user action or input in order to leverage and derive value from the underlying technology. Whenever possible the existing trading processes need to be automated so that the frontend just helps users to request an action which is fulfilled automatically. The various processes and steps such as determining the gas level, or cancelling an unconfirmed transaction, or the acquisition of specific tokens to work with a specific DApp's, or moving funds within wallets, or contributing toa specific crowdsale, or the collateralization of assets to trigger a collateral credit will be done automatically and seamlessly.

5.1.2. Centralized or semi-decentralized switch

Users will have the choice between a semi-decentralized and a centralized mode, or other external modes provided by other third parties. This ability to change modes will give users the choice between a trusted third party and self-custody of their assets, funds, and data through the simple click of a button.

5.1.3. Conversation skills interface

The name Jarvis was inspired by a different key component which will help empower users and simplify the interaction with technology framework. This key component is an AI with conversation skills, hence the name Jarvis. The AI will also provide a new way to interact with the software and reach any features, data, applications, or assets. The Jarvis AI will be the main point of interaction within the software and will be used to navigate within the apps, learn about features, get price quotes, ask questions, etc. As a user continues to interact with the software the AI will learn from the users habits and will automatically display shortcuts toward the most used features within the application. The AI will always be accessible through a "+" button displayed on every screen of Jarvis application.

The AI will further simplify the user experience through writing or voice requests. For example, writing "send 20 Euros worth of BTC to @adam" will pre-configure the wallet to send 20 Euros in Bitcoins to the contact Adam. Saying "ETHUSD H4" will open a ETH/USD chart with a H4 time frame. "BTC" will provide data about the price or will suggest opening a chart or a wallet.

The AI will be able to help and guide users initially by simplifying the setup of an account and will continue to help users by assisting with various commands and monitoring user's activities for mistakes such as entering a non-existing, non-active or wrong address. The AI can also be requested to monitor and analyze the risk and exposure of user's portfolio and so on.

5.1.4. Easy purchase, transfer and exchange of assets.

The interfaces of the Jarvis platform and wallet have been designed to facilitate the exchange, buying or selling of any assets in the system without the need for a complex or traditional process. Buying a fraction of Bitcoin or apple with fiat or any other funding source would take few seconds. The same will also be true for the rebalancing of one's portfolio allocation. This type of user interface will greatly ease the transfer of value and assets. Future iterations will even allow users to seamlessly send Bitcoins to an Ethereum address; or to a contact's a phone number or an email address even if this person does not have Jarvis account.

5.2. Specific features

The wallet is a mobile application designed to better connect users with their finances with a greater emphasis on monitoring and simple payment transactions and asset management while the trading application is a mobile, web and desktop application focused on the trading aspect.

5.2.1. Mobile application Jarvis Wallet

The Jarvis Wallet could be seen as a hybrid solution that mixes the best features of a crypto wallet while also providing features similar to other mobile banking and investing applications such as Revolut, N26, and Robinhood.

A Jarvis Wallet user will have the possibility to manage their asset portfolio or to buy, sell, exchange and transfer assets with ease. The application will also provide easy access to collateral credit, and be capable of making a payment with the use of the Jarvis debit card or the NFC features of their Smartphone. A user could use any asset supported by the exchange as a payment or collateral source. Users will be able to pay their bill with their Apple stocks, Bitcoin, US Dollars, tokenized assets, or any collateral credit.

5.2.2. Mobile / Web / Desktop application Jarvis Trader

The Jarvis Trader Platform will be our flagship offering and is expected to be a primary driver of user acquisition. The platform will initially focus on delivering the most value to high-end and more sophisticated traders who are looking for a user-friendly and yet professional trading platform. The goal is to focus on the most important yet simple tasks such as taking and managing a trade or making and sharing analysis, and with a great emphasis on enhanced social features, such as tipping for rewarding contributors.

The trading platform will provide users with an innovative user experience called "mouse trading". This feature will enable additional faster ways to take trades and adjust the risk of a position. Several other advanced tools such as an integrated block explorer, trade analyzer, market sentiment monitor, and other more traditional technical analysis tools and technical indicators will help ensure proper screening and analysis of the markets.

The platform interface has been designed to be modular so that any user can modify it to better fit their needs. Developers can create widgets in almost any programming language to extend the capacity of the platform. Various tools like a new order book, a trading algorithm, an indicator, or any other desired tools are all possible. These customization options can be used individually or developers can offer their tools for free or for a fee in the integrated store. The store will offer the general community widgets as well as several "business-oriented" one which have been designed to help provide professional traders the ability to deliver and monetize their content. This will include such features as facilitating a live trading session, private chat rooms, e-learning modules, etc…

By default, the interface will be connected to and powered by the Jarvis exchanges, but it could be used as standalone product that can easily integrate other exchanges and traditional brokers. When a user connects to another exchange, they will continue to leverage from the Jarvis Trader UX and UI.
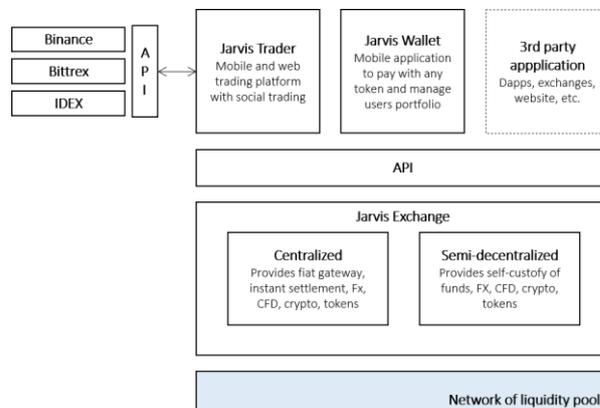
5.3. Applications layer

Figure 2. Applications layer.

6. Additional Security Features

One of the user concerns that prevents cryptocurrency adoption is the security. Whether it is about the security of user accounts or user funds, Jarvis sees it necessary to allocate an important part of our resources to security that does not compromise the user-friendliness of Jarvis. In general security features could be divided into two different categories. The first are those which are designed to help protect against and prevent external threats. The second are features designed to help reduce or prevent user errors. Jarvis has carefully considered both types of risk and security features when designing the technology framework.

6.1. General aspect

Security issues often stem from user mistakes and inattention rather than a forceful breach of a system. With this mind, education is seen as one of the primary ways to reduce the risks. Educational tools and resources specifically designed to reduce this type of risk have been embed within the Jarvis applications and are present from the initial onboarding through the advanced user protocols. There are many helpful tips and assistance powered by the AI to guide users at every step. Jarvis also explains to users why the various steps or actions are needed to secure their account.

To protect users from committing unwanted mistakes, the Jarvis AI can help prevent users from making mistakes such as sending crypto-assets to a non-existing, wrong or blacklisted address. The AI will also be able to perform requested risk checks like asking users to

double-check details for transactions over a specified amount.

In addition to the AI solutions the various Jarvis interfaces and systems have been designed to give the user greater control and the ability to decide whether they want their funds managed in a centralized or decentralized way.

6.2. Centralized way with non-custodial wallet

Generally, it is expected that the centralized option will be the best for most new users due to similarities it has with existing financial applications.

6.2.1. Funds protection

When users delegate the security of their funds to the Jarvis Exchanges or other 3rd party partners, these funds will generally be stored in multiple multi-signature cold storage wallets located in different locations and secured by different regulated teams. Extensive AI and monitoring solutions combined with ongoing audits every 30 minutes will be utilized internally to help reduce risks to funds to the greatest extent possible.

6.2.2. Users account protection

While Jarvis will do all that is possible to ensure the highest level of security against external threats, it is clear that just merely complying with existing financial regulations or industry "Best Practices" such as providing multi-factor login, IP or device monitoring, is woefully inadequate when it comes to fully protecting clients.

Security options in Jarvis will be further enhanced by hardware solutions for 3FA logins, and more. This type of solution would only allow either trading or a login to the account when this device is connected. There are a wide range of hardware solutions which can be implemented. Some examples include a USB key or magnetic card that needs to be connected to the users phone or computer either manually or through a NFC or Bluetooth connection. Such devices could also include a requirement for a fingerprint or to push buttons for a manual confirmation of any account related action. These solutions combined with algorithmic authentication codes (like Google Authenticator) could help ensure a wide range of options which will be convenient yet ensure a very secure trading environment for Jarvis users.

To avoid fishing, when setting up an account, users will have to choose 3 colors. When logging into their account, before entering their password, Jarvis will always show these 3 colors so users can know if they are on the official website.

6.3. Decentralized way with custodial wallet

Numerous centralized exchanges have been hacked and remain a prized target for hackers. Such situations have created a lack of trust for these entities and has helped to drive users to adopt cold storage and self-custody solutions. While such a solution provides great security this also requires that users take full responsibility. However, the outdated methods like the 12 words passphrase or paper wallet do not provide the ease of use that is required for large-scale adoption.

6.3.1. Storage of private keys

Much like the system in a banking debit card whose pin code decrypts the key encrypted within the card, the best practice for storing the private key is when it remains encrypted on the user device. Additional options will be offered to users to store their private keys within a cold storage solution such as plastic card or USB device; the same device used with the centralized exchange to increase the login process can be used to store the encrypted private keys of users. The keys could be decrypted by a password, a pin code, or some biometric input. In the event the device is lost or stolen, users will be able transfer all their funds to another address with one click for safety. However, to sign these transactions, users will need to enter their private keys or their seed, which users will be required to know or retrieve.

6.3.2. Retrieval of private keys

To retrieve private keys, blockchain systems usually use a seed made of 12 words. While considered a secure method, the encryption of the keys within a 12 words seed is not convenient as it has to be stored on paper. With the advent of pattern and image recognition technology, the 12 words could be replaced by an item users take a picture of, or a biometric face scan, or a combination of various verification methods including a face scan, an image of an object, a drawn pattern, a color, a word, or a pin code, etc… Such custom methods would normally be considered easier for the user to remember and thus facilitate the recovery of the private key. All of these options will be provided so that users can choose their preferred one.

In the case users would not be able to retrieve their private key alone, another option will be through the use of trusted devices. These days it is common for persons to own multiple devices such as a Smartphone, tablet, computer, or even a smart watch. Any user owned and controlled device could be designated as trusted and could host the user's encrypted private key. Specific small applications will be developed for each type of device and will allow them to hold and encrypt these keys while also allowing users to retrieve them easily with a pin code, password or any multi-factor authenticator such as a biometric scan.

Similar to the way a trusted device works, a trusted third party could be utilized to store all or portions of a private key. Such third-party solutions will most likely deliver the highest level of convenience. When using such external parties it could be possible to break up the seed and store different parts of the private key with various external providers so that even if decrypted the information would still be incomplete. For example: only 11 of 12 words for the 12 words passphrase, or the private key without the first or last character would be stored externally. While some external solutions will require an account that has passed the KYC procedure others will not. Delegating the management of keys externally will not mean the user needs to switch to a centralized system. If wanted, the users will be able to remain anonymous. Other options for private key storage include the keys being held with other trusted Jarvis users. In the case a user would like to retrieve a seed or keys, they will send a message to their contacts holding the portion of their keys through one of the Jarvis applications.

Additionally, other more traditional solutions will be provided to advanced users such as allowing them to print their keys or 12 words passphrase or to save them on other cold storage solutions.

7. Jarvis Tokens

7.1. Jarvis Dollar Token

The Jarvis Dollar token is a centralized stable coin backed by real dollars. It always worth 1 dollar and is used as a medium of payment and as an asset for trading crypto/fiat pairs as well as use with digitized Forex and stocks from a wallet. The Jarvis Dollar token will be launched following the finalizing of several banking partnerships.

The Jarvis Dollar smart contract will hold billions of Jarvis Dollar tokens but will only unlock one token for each real dollar deposited in a Jarvis banking account. To ensure that each Jarvis Dollar in circulation is backed by a real dollar in the Jarvis banking accounts, an independent audit will be conducted every 30 minutes on the smart contract and on the banking account. The results of this audit will be published on a major blockchain such as Ethereum or EOS.

Due to the current lack of strong publicly available and audited stable coin options, Jarvis has pursued establishing our own stable coin on the Ethereum network. However, we will look at the evolution of Ethereum network following the implementation of various scalability solutions and if the newer Proof of Stake model does not significantly improve costs and scalability on the network then Jarvis will either use a different network such as EOS and/or will use an external stable coin solution if a strong option with real time audits. The Jarvis Exchange Framework allows for multiple internal and external stable coins to be implemented and used.

7.2. Jarvis Reward Token (JRT)

The role of the Jarvis Reward Token (JRT) is to help grow the user base by redistributing the income of the Jarvis ecosystem as a reward to token holders, users, partners, and developers. This token and its associated structure aim to help create an unending cycle that will continue to support the growth of the project.

7.2.1. Reward mechanism

On a monthly basis, a minimum of 20% and a maximum of 40% of the revenues generated by Jarvis will be dispatched among token holders. The market has already proven that an exchange with a fiat gateway has great value in the financial services industry. The Jarvis Reward Token makes this exchange even more unique in that it will continue to reward token holders by distributing to them such a large portion of the income. The revenue distribution will be done in a fixed value instrument such as the Jarvis Dollar. An additional minimum of 5% and maximum of 10% of the revenues generated by Jarvis will be distributed among the TGE participants to further reward them for their trust and risk taking.

7.2.2. Distribution of the tokens

The Jarvis Reward Token (JRT) will be used to reward all participants of the ecosystem including TGE contributors, partners, users, and developers, and anyone who is bringing more users or adding more value to the ecosystem. Two pools of tokens have been created in order to distribute to the partners, developers, influencers, and users so as to incentivize them in a virtuous circle. The more value they add to the ecosystem, the more tokens they will receive as a reward. In that these tokens are connected with portion of the company revenue, the holders of the tokens will be incentivized to keep bringing more value to increase the revenue of the ecosystem, and their revenues as well. The first pool will focus on more B2B or partner relationships and the second pool of Jarvis Reward Tokens will be managed by the Jarvis DAO. Anyone who holds Jarvis Reward Tokens will gain membership and rights in the Jarvis DAO.

8. Jarvis DAO

Every Jarvis Reward Token holder will gain the opportunity to be involved with the Jarvis DAO. The Jarvis DAO's primary role is to organize the community and to manage two pools of tokens which are designated to foster new user acquisition. The first pool of tokens will consist of 30 Million Jarvis Reward tokens which will be allocated to the DAO few months after the conclusion of the TGE. The second pool of tokens will come from a monthly allocation of profits of the Jarvis ecosystem proportionate to the Jarvis Reward Tokens that the DAO is holding. It is expected that the second pool of funds will be held in Jarvis Dollar or other stable token. Through a voting mechanism, DAO members can decide to organize trading contests, hack-a-thons, bounty campaigns or other campaigns which will utilize the funds the DAO is holding. All members of the Jarvis community will be welcome to and encouraged to provide ideas or proposals for projects, DApps, and other events which can help improve or grow the Jarvis ecosystem. After an idea or proposal has been vetted by the Jarvis team to ensure feasibility, only the members of the Jarvis DAO will be able to vote on the proposals they would like to see pursued. DAO members will then be able to vote on a regular basis on which project proposals and initiatives they would like to see funded.

The two different pools of funds will have different allocation rates. The pool consisting of Jarvis Reward Tokens will have a fixed quarterly distribution rate. This distribution rate will be determined by the first vote of the DAO. So for example if the DAO votes to distribute this pool of 30 million tokens equally over a 6 year period then there will be 5 million tokens available each year. This would make 1,250,000 Jarvis Reward Tokens available each quarter for projects and events which will help grow the community or enhance Jarvis. If for any reason the tokens allocated to a specific quarter are not fully utilized then the DAO will be able to vote if they would like the tokens destroyed or returned back to the pool.

In addition to the pool of Jarvis Reward Tokens there will be the second pool of funds derived from the monthly profits. This pool of stable tokens will also be available for full or partial distribution towards projects and initiatives which can help improve Jarvis. Between these two pools of tokens the Jarvis project will be able to ensure ongoing financial support for a wide range of community driven initiatives. The funds and initiatives supported and managed by the Jarvis DAO will not be the only growth mechanism for the ecosystem but have been designed to be a very complimentary structure to further enhance the projects and initiatives which will be supported and driven internally by the Jarvis team or by other partners in the Jarvis ecosystem.

There is a wide range of ways these two different token pools can be allocated. It is anticipated that the DAO will vote to distribute a portion of the tokens to various parties who are helping to support Jarvis. Some examples might be to allocate tokens as a reward for content contribution, or a reward allocation based on the number of new users a person or entity have referred this month, etc… The goal of these token pools is to ensure that users, partners, and developers will always be entitled to receive monthly revenue through their tokens and stay incentivized to keep contributing to the ecosystem.

9. Jarvis TGE

The Jarvis team has decided to run a TGE to increase the funds to speed up the expansion of the project instead of utilizing other funding options. A Token sale allows Jarvis to simultaneously run a marketing strategy to acquire users, to raise funds, and to increase general awareness of the project. This will help to attract new clients, additional team members, and potential partners who all benefit from the exposure.

A key advantage of using the TGE to expand the project is that many contributors will also be existing or future users of Jarvis and will thus be rewarded by holding tokens and helping build the community.

9.1. Details of the TGE

Token name	JRT – ERC20
Reward rate	20% of the revenue
Total number of tokens	420 000 000
Token price	$0.10
Hard cap	$21 000 000
Currencies accepted	ETH
Presale	• 30% during the presale period
Main sale	• 20% during the 1st week • 10% during the 2nd week • 0% during the last week
KYC required?	Yes
Ineligible contributors?	Citizens or residents of The Republic of China, USA, Canada, and a few other jurisdictions.

9.2. Token distribution

Token distributed to contributors	280M (70%) • 260M for TGE participants • 20M for bounty and airdrop
Tokens for the DAO pool	30M
Tokens for the partnership pool	50M
Token for the company	60M • 50M for the core team • 10M for the advisors

9.3. Additional Bonus Pool for TGE Participants

We are aware that right after a token is listed on exchanges sometimes uncommitted holders choose to sell their tokens with the plan to possibly repurchase the tokens in the future. It is therefore critical for Jarvis to do all that is possible to ensure the participants of the TGE get even more value for acquiring the token during the TGE rather than after when it gets listed on an exchange. To facilitate this Jarvis will reward the original TGE participants with an additional 5% monthly bonus of the Jarvis revenue beyond the already planned 20%. 4% will be allocated among every TGE participants, and 1% among the presale round participants. This will be valid for all original TGE participants who hold their tokens on the Jarvis exchange or other approved wallet. Eligibility for this bonus will continue for all original TGE participants for all tokens acquired during the TGE. Tokens acquired by original TGE participants after the TGE has concluded will not be eligible for this additional monthly bonus.

9.4. Token Buy Back and Unsold TGE token destruction

To further ensure that the Jarvis Reward Token maintains as much value as possible for its holders both at the conclusion of the TGE and for years to come two different solutions will be used. First, any of the tokens for the TGE which have been allocated for sale, or airdrop or bounty programs which are not sold or used will be destroyed after the TGE has been concluded. This will help to ensure that the initial token value is preserved. The second method used to ensure token value will be an ongoing buyback and destruction of Jarvis Reward tokens by the company. The way this will work is that every quarter a portion of the company revenue will be allocated for token buy back. Then the company will use these allocated funds to purchase Jarvis Reward Tokens from time to time from the open market. Any tokens purchased by the company will be destroyed and a record of the destroyed tokens will be published. This will lead to an ongoing or continuous reduction of JRT tokens at the same time that the company is becoming more profitable. Because the monthly reward will be distributed evenly to all tokens the lower the number of tokens the greater the reward. Thus, the value of the tokens should increase at an exponential rate over time because the increasing profitability will further facilitate the company to have more funds to buy back and destroy more tokens while at the same time the increased revenue of the company will also be distributed each month.

10. Monetization

Jarvis is planning to exploit the exchange capabilities through various revenue streams and business models. The first and more obvious one is through transactions fees. On the centralized and on the decentralized exchange, the targeted fees are expected to be as low as 0.1% for the taker and 0.05% for the maker, and a 0.5% fee for all fiat withdrawals when the exchange will reach certain milestone. For example; the TGE will provide additional funds to the exchange to setup an additional internal liquidity pool which could help lower the fees. For some assets and operations fees might be adapted higher or lower depending on market needs or conditions.

By providing a public API, Jarvis will be able to provide liquidity to compliment solutions and products being offered by partners. The Jarvis API will help partners provide wallets, a fiat gateway, or as convenient way to exchange one asset for another. The API would also be able to support a wide range of DApps and will be able to provide access to both centralized and decentralized exchange liquidity. This will allow other exchanges to share our liquidity pool, external trading platform, and other software components. Any entity using the API will be considered as a partner and will be incentivized through various profit sharing programs or other appropriate options.

Exchanges fees are expected to drastically drop over the coming years. It is anticipated that the Crypto exchange fees will follow a similar trajectory to that of Forex exchange fees. They will continue to go down at an even more rapid pace than Forex did. Where it took Forex more than 10 years to bottom out, the Crypto market will probably achieve this in less than 5 years. Further technological developments and more exchanges will enable more competition that will drive the fees down.

We have already begun to see this with some decentralized exchanges which are offering trading with no fees other than the blockchain processing fee charged by Bitcoin or Ethereum network.

As Jarvis continues to grow, it is expected that it will become more autonomous from liquidity aspects of the business and will be fully capable of offering other exchange pricing models such as a fixed monthly fee or even fee free trading as clients take advantage of other tools and resources in the system which will help to generate revenue for the company. We see this business structuring as vital to ensure ongoing value for token holders and for the longevity of the company.

10.1. Investment marketplace and store

Over the long term, one of the key revenue streams of the company will come from the market place and the store. The market place will list partners' tokenized assets and funds along with ICO/STO, while the store will list applications and widgets, as well as services. It is expected that this will increase exponentially as the user base continues to grow. Transactions in the marketplace and the store will eventually generate a large share of the profit among Jarvis' activities. The model consists of offering an exposure for partners applications, widgets, services or investment opportunities (TGEs, managed funds, etc.) and then charging 0.5% to 5% on the transactions conducted.

10.2. Traditional Assets and Institutional Offering

As mentioned previously there will be both FX, CFD's, and other traditional assets incorporated into the product offering. Because of the extensive background of some of the team members with traditional financial markets there will be an additional focus on B2B and more institutional offerings which will not always be publicly disclosed. Some of the institutional side will include providing liquidity to other exchanges over a wide range of assets as well as Omnibus accounts and white label offerings of the Jarvis Exchange. The institutional offering also includes additional Fiat gateway and custodial account holding options which will not be available to retail clients. For more details on the bespoke offerings available to institutional partners please contact Jarvis directly.

The business model will evolve to adapt with the competition, new technology, and the legal landscape. Jarvis will keep exploring new business models to ensure that users of the platform will always have access to tools and resources that help them financially. One example of this could include various ways that users

will be able to monetize data that they generate through activity in Jarvis.

11. Client acquisition

The exchange market is a highly competitive one. It is important for almost all client oriented companies to focus a significant portion of their energy toward growing the user base. The Jarvis team expects the existing Jarvis community to continue growing exponentially due to a wide range of factors. These factors include the user-friendly interface with a wide range of features, a competitive fee policy, a wide range of assets with deep liquidity, extensive DApp solutions, etc. Further community growth will be supported through traditional marketing campaigns; a very competitive referral program, airdrops, and such projects as will be proposed and endorsed by the Jarvis DAO.

11.1. Referral program.

Referral program strategies have a good proven track record which directly incentivizes users to invite new users to join. Robinhood, Binance and Kucoin as well as other Fintech companies have used these strategies to grow their user base. The Jarvis referral program consists of a multi-tiered reward program which benefits users, partners and developers who invite new users to join by redistributing a portion of the referred parties fees to the respective person who introduced the user to Jarvis.

For example; Bob refers Alice and earns 20% of the fees paid by her. Alice refers John and she will earn 20% of the fees paid by him. Bob also receives 4% of the fees from John (20% of 20%). John invites Michelle and earns 20% of the fees paid by her, Alice then receives 4% of these fees and Bob receives 0,8% of these fees.

11.2. Crypto holders

One of the user acquisition strategies is to provide additional benefits and resources to long term "hodlers" of crypto assets. Several options for storage including personal wallets and cold storage will be provided. Key benefits for such users will include the ability to easily loan and collect interest on holdings while also maintaining easy access to the Jarvis system which provides liquidity and interoperability for their assets should they decide to change their portfolio allocation or holdings.

11.3. Developers

Programmers are a very important aspect to the strength and success of the Jarvis community. It is external programmers that contributed to the success of MT4. Jarvis provides programmers with a powerful and well documented API that allows them to develop almost anything they can imagine and to then use this personally or to share the product for free or to sell it on the store.

11.4. Service providers.

Services providers are often influencers and are leading large trading communities. By providing the opportunity for service providers to run their business entirely inside Jarvis, it will help to grow the user base. Jarvis already has several service providers who are leading big communities who have joined the Jarvis project. For example; in the Jarvis team itself there are already several community leaders who will move all of their business within the Jarvis platform as soon as the centralized exchange is launched. This will undoubtedly lead part of their large communities to trade on the Jarvis Exchange.

11.5. Traders

As previously outlined, the Jarvis trading platform can be used to connect to other traditional brokers and other exchanges. These features allow the Jarvis interface to be used as a standalone product. These open features will further facilitate growth of the Jarvis community through external partners driving their users to the Jarvis platform. It is when such clients access and use the various unique features that have been combined for them in Jarvis that they will look to further utilize the platform as they strive for better and easier management of their financial resources.

12. Real Time Audits

To help compliment the other hardware and software security features, Jarvis has already arranged with external companies to implement a very extensive auditing program. This program is currently planned to provide a general audit every 30 minutes and a full audit every 12 hours. The results of the audits will be posted on our website as well as on a Blockchain to provide confirmation that results have not been changed. The audit will include such things as the number of Jarvis Reward Tokens, other crypto holdings, Jarvis Stable coins, and the Fiat holdings in banks or exchanges which are backing the stable coins. Auditing these data points as well as others will help to ensure that all Fiat and

crypto reserves which can impact the company or its users are properly monitored and accounted for. Internally, system components, crypto holdings, and other important data points are always monitored real-time.

13. Licenses and Legal Compliance

The Jarvis exchange does not to run away from regulation but towards it. The Jarvis team comes with decades of combined experience in managing and holding licenses for top regulated brokerages in a variety of jurisdictions including the USA, UK, Korea, Japan, Cyprus, Australia, and more and is working extensively with legal teams around the world on a variety of complex regulatory compliance aspects.

At this time Jarvis has an exchange license which allows for FX, CFD, Digital Currencies, and other asset classes. Currently several additional licenses are already being planned to obtain licenses in the UK, Switzerland, and possibly other locations in Europe such as Malta. Licenses in the US, South Korea, Japan, Australia, and other jurisdictions are expected to be facilitated via existing relationships with already licensed and established brokerages.

We are also carefully evaluating additional regulatory developments which are specifically related to digital currencies and digitized securities in Belarus, Malta, Estonia, Switzerland, and other countries. The second aspect of digitized securities is of particular importance because of the incredible applications of such products for institutional or large-scale investments. The Jarvis team is very aware of the complex issues surrounding ongoing legal compliance and the Jarvis infrastructure has been designed to be able to address these ever evolving compliance aspects.

14. Road map

The road map is being separated in several phases.

Phase 1: 2017-2018, the initiation. During this phase which started in late 2017 we have initiated the development of the centralized exchange, its trading interface and its wallet. The backend of the exchange has been finished and currently supports BTC, BCH, ETH, DASH and USDT. We have developed and finalized our own HTML5 Canvas charting library. Following this, we have finalized two working prototypes (Windows) for the trading interface, one for Forex and one for crypto trading, to showcase our UX/UI ideas and features. In parallel we have also launched a simple BTC and ETH mobile (Android and iOS) and desktop (Windows and MacOS) wallet. We have also launched a Python to JavaScript converter in order to execute Python code into the JavaScript interface. This allows

python programmers to execute trading bots or analysis tools within the trading interface.

Phase 2: First Quarter of 2019, the launch. We will be launching our centralized exchange. Initially the exchange will support cryptocurrencies and fiat, but Forex and CFDs will be added by the end soon after. With the full range of products, it will be possible to address the Forex and CFD traders. Jarvis will allow them to trade from a wallet rather than with their traditional broker. With the launch of this first product, the DAO will be officially opened and start actively helping to promote the Jarvis exchange offering.

Phase 3: Second Quarter of 2019, the expansion. During the second semester, the trading interface of the exchange (named Jarvis Trader) will be launched as a standalone solution to be connected with others exchanges and other brokers to raise the awareness of our brand, products and philosophy. We are confident in our ability to drive user acquisition through this platform as its features have already been tested with 500 traders, which gave a very positive feedback and were willing to change their usual trading platform for Jarvis Trader. In parallel, by the end of the year, the payment gateway will be active following the obtention of a European license and the mobile application will be launched.

Phase 4: end of 2019-2020, the path to decentralization. By the end of the year 2019, we will be launching our custodial wallet and semi-centralized exchange solution. Doing so, users will be capable to participate to the decentralized liquidity pool and lend their assets for several use cases. Initially the wallet will only be capable of escrow for peer-to-peer trading and will be integrated to several partners Ethereum, Neo and EOS decentralized applications.

Phase 5: 2020, Decentralized finance. Following the launch of the semi-decentralized exchange, the collateral credit will be available within the custodial wallet, allowing to launch a fully featured custodial wallet which allow to instantly connect to the payment gateway. This will set the path for building a decentralized and personal financial hub and to expand the offering to tokenized assets and funds. Eventually, the data-locker will be launched, which will help to store users data in a decentralized way in order to build a fully decentralized ecosystem.

15. The Team

The Jarvis founders come with decades of experience in managing trading, brokerage operations, and developing some of the most robust matching engines and exchange software that is being utilized today.

Jarvis has gathered a core team of incredibly talented and passionate people coming from diverse backgrounds but united around the same idea: contributing to this revolution and creating products that will change people habits. One of the goals of our TGE will be to further expand our capacity of execution by the addition of other talented and experienced members. The media coverage and the success of the TGE will help us reach new prospective team members of Jarvis.

Pascal Tallarida, founder and CEO. Pascal is an entrepreneur and Senior Forex trader with more than 11 years of experience. He founded a prop trading firm and one of the leading trading schools and trading communities in France called DMTrading. DMTrading is followed by 18k+ French traders. Pascal is a renowned lecturer and is a frequent speaker at conferences and universities throughout Europe. Actively involved and greatly respected in the French trading community, his trading followers have been the first testers of Jarvis. By closely working with thousands of retail traders for years, he acquired an in-depth knowledge about what traders want, how they think, and what leads them to choose a trading platform or trading service. This has helped him to understand their needs in terms of features and user experience. He is an active trader of, and educator on cryptocurrencies. He has led his team of traders to try most of the existing exchanges and trading platforms.

Andrew Anderson, founder and CTA. Over the past two decades Andrew has held many senior level positions in top regulated financial institutions located around the world. Andrew brings extensive experience coming from years of helping to oversee operations for entities with more than 250,000 clients in 140 countries with monthly trading volumes reaching $80 Billion. In addition to holding various licenses from regulators on multiple continents, Andrew has also overseen the development and successful delivery of both frontend and backend trading solutions involving various trading and liquidity technologies. Andrew began to be involved with Blockchain in 2010. His interest in and knowledge of the wide range of applications that distributed ledger technologies can deliver has continued to increase from this time. Andrew is passionate about the many ways that blockchain and other distributed ledger technologies can be used for increased efficiencies in business operations and the ways that the associated technology solutions can empower and improve the lives of people around the world.

Cyril Tabet, founder. Cyril graduated from York University, Toronto, Canada in 1999. He is an award-winning Telecom and Financial Services executive who held C-Level positions launching and driving the expansion of multiple telecom and financial firms including ActiVia, Alpari, Interbank FX and JFD ranking them into top 10 worldwide listings. His latest success was to position JFD among the world's largest MT4 brokers in less than 5 years, leveraging from his

strategic vision and in-depth knowledge of the Fintech industry. Passionate about tech and business transformations, Cyril most recently co-founded, seeded and/or supported the deployment of multiple innovative ventures predominantly focusing on Blockchain, Financial Services, Data, AI and CSR solutions.

Emmanuel Grand, UX designer. Emmanuel is passionate about people and experiences. He spent several years as a diving instructor in Australia, Thailand and Mexico, all the while day trading from all over the world. Emmanuel is perfecting the simple and powerful UX and UI in Jarvis, utilizing his knowledge of what traders need and want. He is passionate about Jarvis and the immense possibilities the project presents for traders.

Petar Kirov, lead developer. Petar started as a developer support officer at Telerik where he helped customers build .NET apps. Later on, he decided to follow his passion for system programming by joining a core C++ platform team at VMware. Petar has also been contributing to the D programming language and is passionate about open-source leading him to want to contribute to the Blockchain ecosystem. Petar leads all software matters at Jarvis, from design and implementation to DevOps.

Ivan Zhelyazkov, software developer. Ivan is an ambitious coffee-driven software developer with 4 years of C and C++ programming experience. Ivan has an interest in blockchain technologies which led him to learn Solidity and write smart contracts.

Fabien Ducoudray, TGE strategist. Fabien is a strategy consultant and assists companies in setting up and understanding the mechanisms related to fundraising through cryptocurrencies, from reviewing whitepapers to the organization of the communication. He has helped 5 ICOs as a consultant leading him to build a network of private investors and contractors.

Eric Lazovic, business developer. Eric is an experienced business operations manager with top International Commodity Trading companies. While overseeing operations in multiple countries in three continents Eric developed extensive skill in financial controls and risks assessment. Eric has helped oversee the development of new markets for leading global companies such as the Interfood Group with a total value of exchange products averaging an annual turnover of over € 1.6 billion. Eric is passionate about Fintech innovations, and the way they are combining with the fast evolving blockchain technologies to create new innovative financial solutions. Eric is good at building teams and helping connect people and technologies to create new synergies. Eric brings with him an amazing network of people who are also looking to establish solid and long-term partnerships with major actors in the financial services industry.

Neno Baynov, project manager. Neno spent over two years managing projects for UBER and has 8 years previous experience leading teams and improving and scaling businesses. Neno is managing and tracking processes in Jarvis to build and develop the best management practices. Since 2017, he has also been a successful crypto investor and Forex trader.

Stefani Todorova, PR and communication. Stefani studied PR and mass communication in Sofia University. One of the first team members at Jarvis, Stefi is developing the PR and marketing of Jarvis, as well as managing the office and administration of the company.

Aleksandar Chervenkov, marketing manager. Over the last decade, Alek has challenged himself with various projects, building versatile marketing experience, which naturally led him to develop a strong interest in the crypto domain. Prior to Jarvis he played a key role in several international IT companies relating to construction, web hosting and affiliate marketing networks. He is ecstatic to be working on a cutting-edge Jarvis Edge project.

Karina Delcheva, community manager and data analyst. With a background in the charity sector and a BScin Social Policy Karina brings a sociological and ethical side to data analysis and practice within Jarvis. She is passionate about machine learning based on human-produced data. In preparation for the fundraising, Karina is using her community and PR skills from the charity sector to work on the community and social media campaign in Jarvis Edge.

Vsevolod Potorocha, **community manager**. As an aspiring and motivated business student specializing in digital marketing, Vsevolod (Seva) joined Jarvis as a community manager for the Russian sector as well as plays a key part of our Social Media campaign.

Todor Licheff, UX/UI designer. With a Bachelor of Engineering Design, Todor is an experienced Graphic Designer with a demonstrated history of working in the graphic design industry. He is given to Jarvis its branding and visual identity.

Tio Torosyan, **graphic designer.** Tio is an artist, graphic designer, illustrator and art director. He has always been passionate about art and creativity. He has mainly worked in fashion magazines as a creative director, and as a game designer before getting interested by Blockchain technologies. He is the curator of Jarvis visual content.

Stefan Tonev, videographer. Stefan graduated in "Cinema and TV" at New Bulgarian University in Sofia. He has worked as a cinematographer for several Photography studios. He has done various projects as aftermovies, corporate and backstage videos. Through his lens, Stefan is recording the unique development of Jarvis.

16. Conclusion

The world of today is built on the top of the traditional financial system. It is the legacy of hundreds of years of evolution, and has delivered a lot of value. Over time it has evolved in a way that empowers itself, banks, governments and other large corporate structures, more than the individuals with access to banking and the billions of unbanked people around the world. Decentralized technologies allow for a user-centric financial system that is free of these legacy limitations and where value can be shared by everyone. But these decentralized technologies are still in their infancy and do not allow users to leverage from them with ease or at a large scale. Centralized solutions are not worse than decentralized ones, they are complementary and when combined together they can deliver greater value than they can provide alone. The Jarvis technology framework has been specifically designed to leverage from the best of both centralized and decentralized systems and to make all of these benefits interoperable.

A good user experience delivered through a simple to use interface is the key to driving the adoption of this new way of interacting with finance. Jarvis has been designed using the collective input that has come from an experienced team working with a community of thousands over the past decade. With the proper interface and design, billions of users will be empowered. The features delivered through Jarvis can truly change the way people manage their finances and the way users will define money.

The Jarvis team is excited to be delivering such a solution that can truly help change the world through user empowerment.

It is important to note that the Jarvis Exchange project is the first milestone of our long-term mission. It will pave the road for building a strong liquidity network, user base, team and awareness to fulfill our long-term vision – **the Jarvis Network, the Internet of Finance.** The Jarvis Network is the multi-layer technology that provides a backend to connect and unify on-chain and off-chain financial resources, applications, liquidity, assets and data and make them interoperable and accessible. It allows to build centralized or decentralized applications upon it to leverage from its core features. It is the natural evolution of the Jarvis Exchange framework.

Disclaimer

The information found in this document, the Jarvis.Exchange website and other prepared materials is meant for educational and informational purposes only. Nothing in this

document, the Jarvis.Exchange website, or other materials prepared by the company should be construed as a recommendation to buy or sell cryptocurrencies or securities or to trade using any particular strategy or method. We are not soliciting any action based on this material. It has been prepared as general information for anyone who is or may become interested in the Jarvis.Exchange project. Nothing found in this document, the website, and associated materials should be considered trading, financial, or investment advice.

Some of the statements in the white paper include forward-looking statements. All forward-looking statements address matters that involve risks and uncertainties. Accordingly, there are or will be important factors that could cause actual results to differ materially from those indicated in these statements.

For further information on the Jarvis.Exchange project and to read the full terms and conditions, disclaimers, and other important information related to the project please go to www.jarvis.exchange.

Glossary

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centralized: A type of network where all users connect to a central server, which is the acting agent for all communications. This server would store both the communications and

the user account information. Most public instant messaging platforms use centralized networks. Also called centralized server-structure

Decentralized: describes the design of a network that isn't managed by a central party. A decentralized network relies on a host of computers. As a result, blockchain technology resides on a P2P network. It physically cannot work with a single computer or point-of-connection. Instead, it requires a slew of other computers to join in, in order to complete a specific task on the network.

DApp: is an abbreviated form for *decentralized application*.
A DApp has its backend code running on a decentralized peer-to-peer network. Contrast this with an app where the backend code is running on centralized servers.
A DApp can have frontend code and user interfaces written in any language (just like an app) that can make calls to its backend. Furthermore, its frontend can be hosted on decentralized storage such as Swarm or IPFS.

Escrow: Escrow is a legal concept in which a financial instrument or an asset is held by a third party on behalf of two other parties that are in the process of completing a transaction. The funds or assets are held by the escrow agent until it receives the appropriate instructions or until predetermined contractual obligations have been fulfilled. Money, securities, funds and other assets can all be held in escrow.

liquidity pool: is the trading volume created by institutional orders executed on private exchanges and which are mostly unavailable to the public. The bulk of pool liquidity is represented by block trades facilitated away from the central exchanges.

Cross-chain: Cross-chain atomic swaps. The exchange of tokens between users across chains, without trusting a third-party.
Cross-chain atomic swaps are only possible if both chains offer a native escrow function. This requires bitcoin-esque script functions at a minimum. Some chains, such as IOTA and Sia, for example, don't support on-chain trustless escrows at all, and as such cannot implement trustless cross-chain atomic swaps
One of the greatest limitations of cross-chain atomic swaps is settlement time. By definition, these transactions can only settle as fast as the block time of the slower of the two chains. Block Collider's system allows for settlements that are theoretically even faster than the block times of either chain. Enabling cross-chain swaps to settle more quickly than the block times of either chain is a pretty wild idea. Given how slow bitcoin blocks are, Block Collider could carve out an interesting niche.

On-chain: On-chain transactions refer to those cryptocurrency transactions which occur on the blockchain - that is, on the records of the blockchain - and remain dependent on the state of the blockchain for their validity. All such on-chain transactions occur and are considered to be valid only when the blockchain is modified to reflect these transactions on the public ledger records.

Off-chain: Off-chain transactions refer to those transactions occurring on a cryptocurrency network which move the value outside of the blockchain. Due to their zero/low cost, off-chain transactions are gaining popularity, especially among large participants.

On demand scaling: On-demand scaling allows you to manually add or remove running dynamic server instances from an active dynamic cluster as needed. For example, if the average user-request backlog in dynamic cluster members is trending up, indicating a need

for higher processing capacity, you can add running dynamic server instances to the dynamic cluster. When the backlog for user-requests drops substantially, you can shut down idle dynamic server instances.

When you expand the cluster, the size must not exceed the limit set in Maximum Dynamic Cluster Size. WebLogic Server adds only running dynamic server instances up to the Maximum Dynamic Cluster Size limit. Also, when you shrink the cluster, the number of running dynamic servers cannot be below the limit set in Minimum Dynamic Cluster Size.

Matching engine: A trade matching engine is the core software and hardware component of an electronic exchange. It matches up bids and offers to complete trades. Matching engines use one or several algorithms to allocate trades among competing bids and offers at the same price.[1][2]

The most commonly used algorithm is time price priority, meaning those bids and offers entered into the match engine first have priority over similar bids or offers that were subsequently entered into the system.

Matching engines support different order types, such as a limit order or market order. Matching engines may have unique APIs, or use standard ones such as FIX APIs.

Peer-to-peer trading: A peer-to-peer (P2P) service is a decentralized platform whereby two individuals interact directly with each other, without intermediation by a third-party. Instead, the buyer and the seller transact directly with each other via the P2P service.

Custodial wallet: A custodial wallet is a wallet in which your private keys are stored by a third party. Thus, you do not have full control over your funds, which makes these wallets a dubious choice.

Non-custodial wallet: may be web, paper, mobile, desktop and hardware wallets—as is the case with custodial ones. However light (non-custodial) wallets allow you to fully control your funds and therefore are more secure

Hot wallet: Hot wallet refers to any cryptocurrency wallet that is connected to the internet. Generally hot wallets are easier to setup, access, and accept more tokens. But, hot wallets are also more susceptible to hackers, possible regulation, and other technical vulnerabilities.

Cold wallet: Cold storage refers to any cryptocurrency wallet that IS NOT connected to the internet. Generally cold storage is more secure, but they don't accept as many cryptocurrencies as do many of the hot wallets. Cold storage devices (e.g. Trezor, Ledger) also cost close to $80 USD, where as hot wallets are free.

Asset custody structure: A service in which a brokerage or other financial institution holds securities on behalf of the client. This reduces the risk of the client losing his/her assets or having them stolen. They are also available to the brokerage to sell at the client's demand.

DAO: A decentralized autonomous organization (DAO) is an entity in a digital system facilitated by smart contracts. Smart contracts involve digital tools and protocols that help support specific transactions or other contract elements.

Multisignature: Multisignature (often called multisig) is a form of technology used to add additional security for cryptocurrency transactions. Multisignature addresses require another user or users sign a transaction before it can be broadcast onto the block chain. The required number of signatures is agreed at the start once people agree to create the address.

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