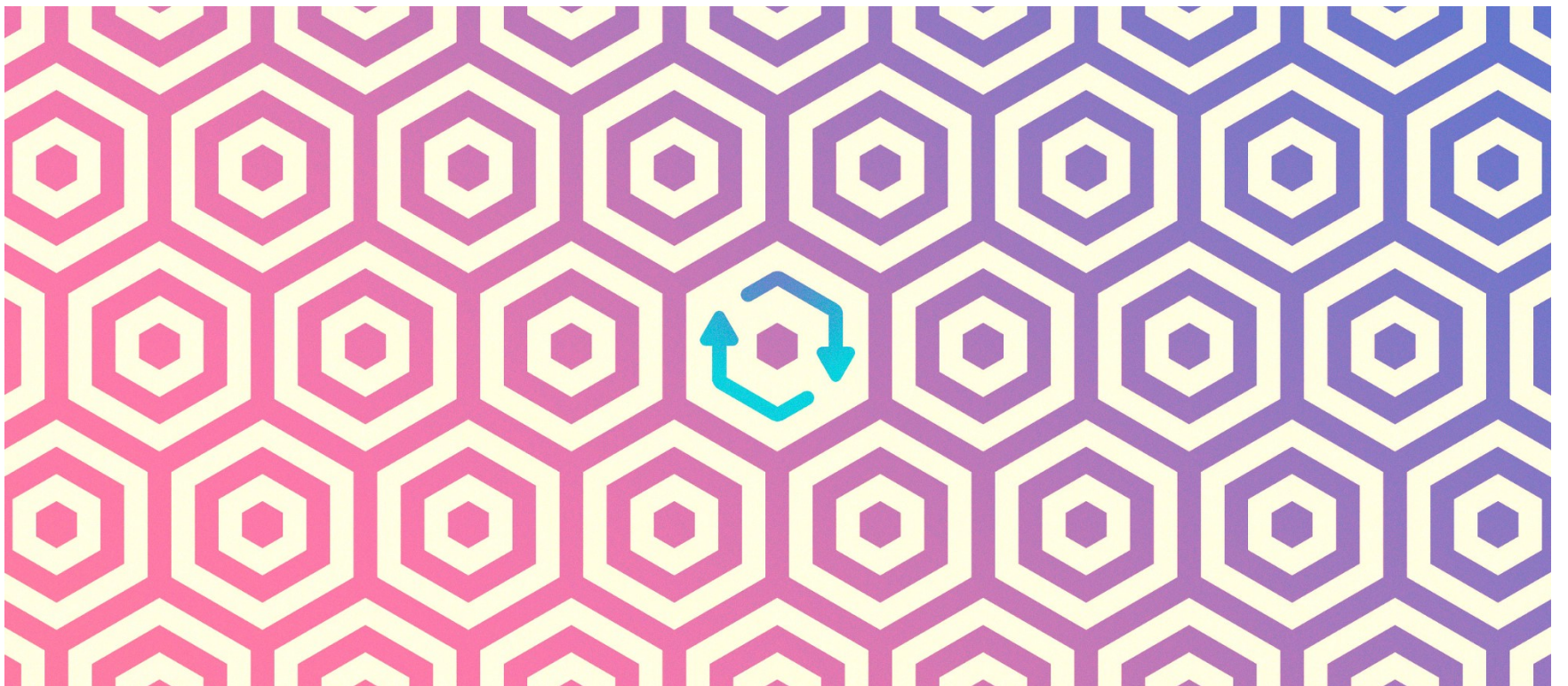# State of Decentralized Exchanges, 2018

VariabL CCO Nathan Sexer undertakes an exhaustive study of current DEX tech and looks towards the (near) future of digital asset exchange.

[Nathan Sexer](#)   Jan 31

CCO @VariabL (@Consensys)— Blockchain, Ethereum, Fintech, Cryptocurrencies

Cryptocurrencies and decentralized technologies are booming. The numbers speak for themselves — market capitalizations have gone through the roof, transaction volume has skyrocketed, and adoption from individuals, corporations, and governments has reached a global scale.

Thanks to blockchain technology, we are moving toward a trustless economy, with no need of third parties to exchange goods. Yet today's digital currency exchanges are centralized. They have proven to be vulnerable to hacks, to react poorly to unusual blockchain events like hard forks, and often run with

a high regulatory risk. Centralized exchanges keep their systems off-chain, meaning they operate as escrows for their clients, and transactions are not recorded on the blockchain. This leads to massive breaches of security and unsafe storage of information, funds, and private keys.

Trading comes with risks, but traders should not face any other risks than those they are already willing to take.

Blockchain entrepreneurs understand this, and some of them are working hard on what many believe will be the future of trading: decentralized exchanges.

Decentralized exchanges — or DEXes — aim to tackle the problems that impede centralized structures by building peer-to-peer marketplaces directly on the blockchain — Ethereum mostly — allowing traders to remain custodian of their funds. However, building a fully decentralized and efficient exchange remains today something of an utopia. Exchanges are centralized because it is the simplest way to proceed, and it is either too costly or technically complex to build fully decentralized platforms — for now, at least.

Throwbacks and inefficiencies of centralized exchanges leave the model with only few advantages. Many semi-decentralized exchanges are coming into action. They are hybrid models between centralized and decentralized marketplaces, trying to deliver the best of both worlds. There is an increasing number of such exchanges, following up on a need expressed by the crypto-community.

This "state of decentralized exchanges" begins with major cryptocurrency numbers and centralized exchanges, which currently monopolize the market. Decentralized exchanges are building the future of cryptocurrencies trading, and this "state" aims to pave its way with its rough listing of projects in the

making. We should pay attention to them as they are shaping the way cryptocurrencies trading will operate in the future.

Disclaimer: I am part of VariabL (a derivatives trading platform on Ethereum) and ConsenSys (one of the largest global blockchain specialists).

I. Cryptocurrency Market Overview and the Flaws of Centralized Exchanges

2017 Cryptocurrency market in numbers[1] :

+3400%*=Market cap of cryptocurrencies is experiencing an exponential growth:

From less than $18B to more than $600B in 2017.

Sunday, Jan 01 2017, 00:02:00 UTC
● Market Cap: **17,735,500,000 USD**
● 24h Vol: **130,048,000 USD**

Source: https://coinmarketcap.com

x240=Amount of transactions performed on the crypto market per day *(Comparing 1st Jan' 2017 and 1st Jan' 2018)*: Around $130M exchanged a day to more than $30B.

Monday, Jan 01 2018, 00:02:00 UTC
● Market Cap: **612,925,000,000 USD**
● 24h Vol: **31,416,500,000 USD**

Source: https://coinmarketcap.com

>170=Number of cryptocurrency exchanges (live, with traffic), growing at an

exponential pace and uncountable number of exchange projects.

More than 99% of cryptocurrency transactions go through centralized exchanges.

II. Centralized exchanges

Let's first define what centralized exchanges are: platforms and apps that enable traders to buy, sell, and exchange cryptocurrencies against fiat currencies or other cryptocurrencies. They are marketplaces for tokens, and are essential to the ecosystem, since many of them enable payments with fiat currencies , i.e. non-crypto holders are able to buy crypto using USD, EUR, etc.

Among most well-known and trafficked centralized exchanges are Bithumb, Bitfinex, Bittrex, Poloniex, Kraken, GDAX, Coinbase and Gemini. Hundreds already exist, but the goal here is not to focus on their number, but rather on their limitations and potential for improvement.

Centralized crypto-exchanges may soon become obsolete as they lose the opportunity to leverage blockchain technology to improve their capabilities and efficiency.

Localethereum's official blog[2] has made a great overview of centralized exchanges[3], laying out various hacks and summing up the main problems linked to these platforms that include:

- **Insecurity**, risk of fund loss and thefts due to their centralized functioning. They are legally accountable and a custodian of users' funds. 73% of centralized exchanges take custody of user funds, while 23% let

users control keys[4]. They represent honeypots for hackers as they are responsible for billions of trades per day and store most of them on their servers.

- A lack of **liquidity**: large orders struggle to be matched. Even at an all-time-high, volumes remain low (compared to traditional markets).
- A **fragmented** (not to say decentralized) market: divides the global liquidity into a few main marketplaces. No clear market leader in terms of volume, which increases the liquidity problem.
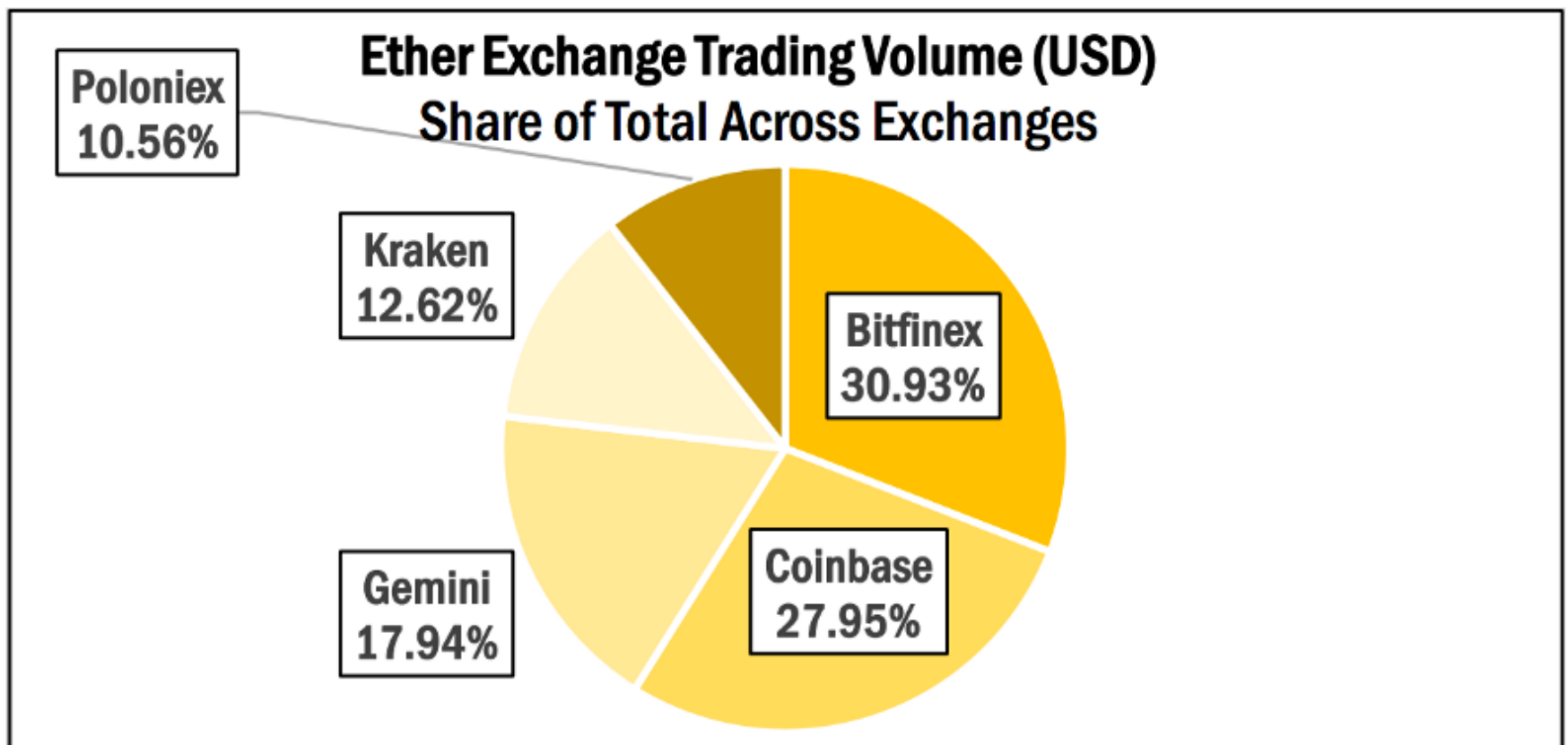
Source: "State of Blockchain—Q3 2017"by Coindesk

- A high level of **risks** for users due to potential performance issues, market manipulation, hardware failures, latency problems, and many other inherent problems when it comes to dealing with large volumes...
- A lack of trust and **transparency:** actual costs and processes of trading are opaque and involve high trading costs, often higher than announced fees and higher delays due to peaks of demand badly managed. Plus, they can front-run orders, which is illegal.
- A lack of **educated** users: markets are flooded by pure speculators unaware of safe ways to deal with cryptocurrencies.

III. Decentralized exchanges and open protocols

Due to the lack of security, transparency, and efficiency that centralized exchanges have demonstrated, a strong demand for decentralized exchanges have surfaced. Scores of new actors are tackling these problems and addressing an obvious need by the community. Projects like 0x, Ethfinex, ShapeShift.io (not decentralized but not custodian) and EtherDelta have emerged and generated a strong interest.

"*Decentralized exchanges promises two major benefits: Security & control and global marketplace*" *by* Michael Oved *(founder of* AirSwap Team*, a* ConsenSys *Spoke)*

One of the oldest projects in the field is EtherDelta, a platform with a simple user-interface and basic trading features (no margin trading), which has already gained sufficient traction to generate up to 25 million USD-equivalent of daily transactions[5].

Definition

Decentralized exchange differ from centralized exchanges as they enable users to remain in control of their funds by operating their critical functions on the blockchain: they leverage the technology behind cryptocurrencies themselves to enable a safer and more transparent trading. It solves the main limitations faced by cryptocurrency markets (see above), since there is no single point of failure, aligning them with what has made the blockchain technology so powerful in the first place.

Most decentralized exchanges are not fully decentralized, but semi-decentralized (full decentralization is today more of an ideal, due to limitations listed hereunder). In most cases, servers (centralized) still host order books (among other features) but **do not hold private keys**.

Another central aspect is that decentralized exchanges present the characteristics, benefits and limitations, of their underlying blockchain.

> ### Main DEX Benefits

> *Trustless, which means that users' funds and personal data are safe.*

> *Security and privacy are well preserved.*

> ### Main DEX Limitations

> *Maintain the same scalability problems as the underlying blockchain.*

> *Most are not easily usable, struggle with liquidity, do not provide fiat payments etc.*

(more details in a section below)

Decentralized Exchange mapping:

Disclaimers:

This "state of decentralized exchanges" may not be fully exhaustive and did not assess all of those projects' viability nor teams' legitimacy. However, an effort has been made towards making an exhaustive mapping. Abandoned or scammy projects might be included. It should be taken with a grain of salt and you should conduct your own due diligence before using or investing in any of those.

1. *All the projects below are or contain decentralized exchanges functionalities in their global offers. Many are not limited to exchange services. For the sake of that study, and since there are not (m)any fully decentralized and working exchanges, semi-decentralized exchange will be included.*
2. *Some exchanges offering advanced financial products such as futures or derivatives like dYdX or VariabL are voluntarily excluded of this benchmark since there is another article in the making for these ones.*
3. *The vast majority is in production/beta; this report aims to list all of*

them and assess their current state of development. I included their website and Medium accounts when available, which provide most of projects' updates.

AirSwap (Airswap blog)

P2P decentralized exchange on Ethereum using the Swap protocol *(Live on February 1st 2018!)*

Altcoin.io (Altcoin.io Exchange)

Decentralized cryptocurrency exchange, powered by Atomic Swaps *(Beta on testnet)*

Barterdex *(by Komodo Platform*)

Open source decentralized network doing atomic swaps *(in production)*

Bancor Protocol (Bancor)

Smart contract based token exchange protocol *(Live on the Ethereum MainNet)*

Bisq *(ex Bitsquare)*

Crypto-fiat open-source exchange with a desktop application working via Tor to trade Bitcoins *(Live)*

Blocknet (TheBlocknet)

Decentralized exchange enabling cryptocurrencies trading and fiat currency gateways through cross-chain atomic swaps and cross-chain data transfers *(In production)*

Coinffeine:

Decentralized Bitcoin exchange with a "Zero Trust" exchange algorithm

(Down)

Catalyst *(by Enigma Project)*

Investment platform for algorithmic/data-driven trading on crypto-assets without a custodian *(in alpha; simulation available)*

Etherdelta

The cryptocurrencies fully decentralized exchange market leader for ERC-20 tokens *(Live)*

Etherex

Open-source decentralized exchange built on Ethereum *(last update on April 2016)*

Forkdelta

Community-driven open source and forked version of Etherdelta, uses the same orderbook and contract *(Live on the Ethereum MainNet)*

Gnosis Dutch Exchange (by Gnosis)

Decentralized exchange for ERC-20 tokens based on the Dutch auction principle *(in production)*

Heat

Real-time asset-to-asset decentralized exchange *(MainNet)*

Herdius (Herdius blog)

Decentralized exchange focused on scalability and cross-chain interoperability *(ICO expected in Q1'2018)*

Hodl Hodl (Hodl Hodl)

P2P cryptocurrency exchange on the Bitcoin Testnet *(Testnet)*

IDEX (by Aurora DAO)

Decentralized exchange that provides instant order placement and execution, free order cancellation, and real-time order book updates. (*Live on the Ethereum MainNet*)

KyberNetwork (by Loi Luu)

Decentralized exchange and conversion of digital assets, api for payments and derivatives *(Demo on Ropsten)*

Legolas (Legolas blog)

Hybrid centralized/decentralized exchange targeting market makers *(In production, ICO Q1'2018)*

Loopring *(by Daniel Wang)*

Decentralized Exchange for ERC20 and Open Protocol to serve multiple public blockchains *(in production)*

Lykke

Semi-decentralized exchange for cryptocurrencies and fiats *(live, with a centralized model. Will switch to decentralized model in the future)*

Mothership (Mothership blog)

Decentralized exchange *(in production, ICO raised)*

NEX

Decentralized exchange on NEO with an off-chain matching engine including payment services. (*in production, trading platform launch expected in Q3'2018)*

Next.exchange

Decentralized exchange focused on ICOs with Crypto-pools and community trading *(in production, launch expected in January 2018)*

Nvo.io

Cross-platform modular / decentralized exchange using the Safenetwork for orders validation *(in production, launch expected Q1'2018)*

Oasis DEX (by Makerdao)

Decentralized Token Market — on-chain market for all token assets in the Maker registry *(live on MainNet)*

OmegaOne (*Omega One*)

Decentralized trade execution platform *(a Consensys spoke, in production)*

OpenANX

Open sourced and governed decentralized exchange *(In production)*

Raidex

Decentralized exchange with Raiden off-chain state channel technology *(in production)*

SingularX (by SingularDTV)

Decentralized peer reviewed trading platform for tokenized intellectual property and ERC-20 tokens *(Live Beta)*

Stellar Distributed Exchange (by Stellar)

StellarTerm is an open source distributed exchange for the Stellar network. *(Live since 2015)*

[Streamity](#) ([Streamity](#))

Semi-decentralized cryptocurrency exchange with fiat onramps *(In production, ICO Q1'2018)*

[Token Store](#)

Ethereum token exchange built on smart contracts in a semi-decentralized way *(Live on the Ethereum MainNet)*

[Waves](#) ([Wavesplatform](#))

Crypto-platform for asset/custom token issuance, transfer and trading on the Waves blockchain, with centralised order matching and decentralised settlement. *(Live since June 2016)*

[Xchainge](#) ([xChainge:](#))

Decentralized exchanges of crypto-assets *(by [Counterparty](#), Open source platform on the Bitcoin blockchain)*

Graphene/Bitshares Decentralized Exchanges:

Graphene is an Open Protocol, see more information below.

[Bitshares](#)

Decentralized exchange providing price stable cryptocurrencies and banking services on the blockchain *(Live since 2014)* *[Probably the oldest decentralized exchange sill working]*

[Blocktrades](#)

Decentralized exchange acting as counterparty *(Live)*

[BTSABC](#)

Decentralized exchange powered by Bitshares and Graphene technology -in Chinese *(Beta)*

CryptoBridge (CryptoBridge)

Decentralized cryptocurrency exchange with multi-signature federated gateway network (*Live Beta*)

Cybex (Cybex Decentralized Exchange)

Decentralized exchange system based on the Graphene/EOS Blockchains *(Beta)*

DEEX Exchange (Deex Ex)

Decentralized exchange with blockchain traded funds and many *(Private Beta)*

GDEX

Offers a stack of decentralized financial services including exchange and banking on a blockchain *(Live)*

OpenLedger (OpenLedger)

Decentralized exchange powered by Bitshares and Graphene technology *(Demo)*

RuDEX

Decentralized exchange powered by Bitshares and Graphene technology — in Russian *(Beta)*

[0x Relayers](0x) ([0x](0x))

0x is an Open Protocol, see definition below and read
https://relayer.network for a great explanation of relayers.

Amadeus

Relayers for dApps looking for liquidity to exchange ERC20 tokens *(in production)*

DDEX (DDEX)

User-Friendly decentralized exchange for ERC20 tokens *(on MainNet)*

Decent Ex (DecentEx)

Decentralized exchange for Ethereum tokens *(on Kovan TestNet)*

Dextroid

Low cost trading and user-friendly exchange on the blockchain. *(on Kovan TestNet)*

ERC dEX (ERC dEX blog)

Decentralized Exchange with advanced financial tools, available on mobile *(Beta on the Ethereum MainNet)*

Ethfinex (Ethfinex)

Community-driven, decentralized trading platform for ERC20 Tokens *(live)*

IDT Exchange (ex Kin Alpha)

ERC20 decentralized exchange *(first relayer to go on the MainNet)*

Paradex (Paradex)

Exchange ERC20 tokens with a centralized matching strategy *(beta on the MainNet)*

RadarRelay (Radar Relay)

0x order book to find and trade any ERC20 token. *(live on the MainNet)*

[The Ocean X](#) ([The Ocean X](#))

0x relayer and liquidity pool for trading Ethereum-based token *(Beta)*

IV. Open protocols for decentralized exchanges:

Definition

Open Protocols are setting up and running decentralized applications (dApps) on a common basis: some are designed especially for decentralized exchanges (ie. *0x*), others also seem suited (ie. *Omise*). Both will be mentioned below.

They create synergies by allowing "anyone" to build their own services on top of them: it fosters innovation and is essential for native dApps to interact with each other. For decentralized exchanges, open protocols present the benefits of creating common pools of liquidity by allowing any project built on top to interact with each others.

[0x](#) ([0x](#))

Open protocol for decentralized exchange on the Ethereum blockchain (live with [dozens of relayers, dApps on open protocols/projects built](#))

[OpenRelay](#)

Open source relay for the 0x protocol

[Lendroid](#)

Open Protocol for Decentralized Lending that Enables Margin Trading and Short Selling of ERC20 Tokens

[Enigma Protocol](#) ([Enigma Project](#))

Decentralized exchange protocol supporting cross-chain atomic swaps, providing an open infrastructure and trading tools

Graphene *(by Bitshares)*

A software platform for deploying decentralized ledgers. Not specifically developed for decentralized exchanges.

OmiseGo (by Omise)

Digital Wallets, P2P exchange & Payments (fiats&cryptos) protocol.

Snowglobe (by Alex Wearn, IDEX & Aurora DAO)

Fully-decentralized exchange protocol; designed for high-performance, EVM-compatible, decentralized childchain exchanges

Swap Protocol (by AirSwap Team)

Peer-to-peer protocol for trading Ethereum tokens, without orderbooks (*to be open in the future*)

V. What May Slow Down the Adoption of Decentralized Exchanges?

Security benefits, by allowing users to remain custodian of their funds, seem obvious and emphasized by all these hacks stories. So why everyone is not using them?

Some aspects are slowing down their adoption: Education and Technology.

Education

Users are not aware of:

- **Drawbacks** and security issues of Centralized Exchanges
- **Security** measures to undertake (how to manage private keys etc.) since

it is users' responsibility

- **Existence** of Decentralized Exchanges
- **Advantages** of Decentralized Exchanges

Technology

- **Usability**: DEX are not user-friendly enough *(very solvable problem, linked to early stages of projects)*
- **Scalability**: Possible blockchain bloat with ethereum network congestion and scaling pressure (with Token sales and a slow gas price adaptation…)
- **Speed**: Transactions take time to be validated on blockchains
- **Cost**: There is a potential high costs per trade
- **Liquidity**: Chicken and the egg problem. Traders do not join because traders are not already on the platform to match their orders; getting liquidity through a large adoption by the ecosystem is a long process.
- **Full decentralization**: Some services have to remain off-chain and have to suffer from limitations of centralized infrastructures (ie. *onchain orderbook are expensive not efficient enough)*
- **Front-running risk**: miners can preview transactions, since they validate them, and can have consequences on any DEX (market manipulation)
- **Interoperability**: need for cross-chain exchanges, and more blockchains/dapps interoperability for decentralized platforms to interact with each others.
- **Accessibility**: Need for fiat integrations and stable tokens for lower volatility.

On the matter, Kyber's chief executive and co-founder, [Loi Luu](#) stated:

> *"centralized exchanges are potentially unable to handle large volumes of users, touting decentralized trading platforms as a better alternative. However, decentralized exchanges are not as user-friendly as centralized options, and may not have the funds to support mass trading due to*

Conclusion

99% of cryptocurrency transactions still go through centralized exchanges; this trend is expected to be reversed in the coming years. Switching to decentralized exchanges is necessary for cryptocurrency users to exploit their full potential, aligning with the decentralized nature of blockchain itself. Education is arriving, and most technological hurdles we face today will probably be overcome very soon.

Differences between projects' value propositions are hard to spot in this field, and most of them will probably not exist in a close future. However, the trend towards decentralized exchanges is clearly evident.

Centralized exchanges will shift toward decentralized technologies sooner rather than later, but improvements have to come from both sides. Users to learn how to protect themselves, and platforms must provide better security tools, as well as education around common issues and best practices.

"Ultimately, I believe that centralized and decentralized exchanges will co-exist as they each provide their own unique benefits," says Linda Xie, who sums up the situation pretty well (talking about 0x). Will Warren (0x Co-Founder) goes even one step further by stating that "centralized exchanges will continue to play a critical role in the cryptocurrency ecosystem, because they offer fiat on/off-ramps." This is one function that fully decentralized exchanges, by definition, do not allow.

If some factors are slowing down adoption, the above-mentioned open protocols (for decentralized exchanges) are fostering development by lowering entry barriers to their implementation and adoption. 0x is probably among the best projects working on the matter. However, even the 0x protocol may suffer from problems like efficiency and scalability, which still represent massive hurdles for the whole blockchain, Ethereum and exchange

ecosystem. Solutions in the making, such as State Channels, or Sharding/Plasma, will allow scaling, albeit with certain sacrifices.

From a wider perspective, decentralized exchange adoption will follow the adoption of the (Ethereum) blockchain itself, alongside better educated users and technological breakthroughs. As mentioned, centralized/decentralized hybrid models will most likely get their break first. Fully decentralized exchanges remain an ideal, towards which most of those projects are aiming.

Some questions remain: does everyone want to take care of their own private keys? Probably not, but they should at least have the choice. Friction for new users switching from centralized exchanges to decentralized ones also remain a big hurdle; even the process of switching represents a considerable effort for most users...

Vinny Lingham ✔
@VinnyLingham

Following ⌄

I'm almost certain we will see a top 25 crypto exchange fail or be shut down in the coming months. This will be the catalyst for the emergence of decentralized exchanges and this is a key theme I'm expecting in 2018.

6:19 AM - 18 Jan 2018

Is the switch is going to happen any time soon? People like Vinny Lingham(Civic) say that some centralized exchanges will soon close, and think this will accelerate the adoption of decentralized exchanges.

If the causes and triggers are matters of debate, we can hardly argue that decentralized exchanges are and will continue to grow as a hot topic of 2018 and potentially an essential pillar of the blockchain ecosystem.

*If a project is not or should not be listed above, contact me and I will make

sure to add/remove it. Feel free to suggest any modification!

Special thanks to [Will Warren](#) (0x), [Michael Oved](#) (AirSwap), Jemayel Khawaja (Consensys) and my team ([VariabL](#)) for their time and support on making this article a reality.

Footnotes:

1. https://coinmarketcap.com
2. https://localethereum.com/ belongs to another type of cryptocurrencies marketplaces not mentioned here but also trending: local P2P token market places. Other examples: https://localbitcoins.com/fr/ or [Dether](#)
3. https://blog.localethereum.com/centralised-exchanges-are-terrible-at-holding-your-money/. More hack stories hacks stories: https://bitcointalk.org/index.php?topic=576337
4. *"GLOBAL CRYPTOCURRENCY BENCHMARKING STUDY"* Dr Garrick Hileman & Michel Rauchs (2017)
5. https://coinmarketcap.com/exchanges/etherdelta/
6. Loi Luu (Kyber Network): https://www.coindesk.com/uc-berkeley-kybernetwork-partner-for-decentralized-exchange-research/

Want to learn more? Check out [ConsenSys.net](#), the [ConsenSys Media blog](#), and our [weekly newsletter](#).

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One clap, two clap, three clap, forty?

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