AlgoDecentral

Whitepaper

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1 Introduction

In the summer of 2021 there is accelerating adoption of crypto currencies. TradFi banks are announcing trading units for their customers and institutions are looking for ways to invest. El Salvador has just announced it is making bitcoin legal tender. The Peoples Bank of China has started a trial of its own digital currency. Other countries Central Banks are looking at ways to regulate crypto currency.

These factors are driving an explosion of capital, and when its finished it could very well transform the financial industry.

1.1 TradFi and DeFi Blocks

There are multiple projects that are building well known centralised functions (lending, margin trading, prime brokerage, safe custody for example) into decentralised versions. These decentralised Building Blocks are growing over time and the critical mass is approaching.

The utility of instant settlement and traceability of ownership are clearly appealing. Many of the workarounds in place in centralised finance such as T+2 settlement, credit checks to ensure that your counterparty wont go bankrupt in those 2 days are gone with crypto. This is radical cost saving and risk reduction.

As well as tokens Smart Contracts can easily be imagined to manage coupon & dividend payments for bonds and equities. If these smart contracts for bonds & equities become real then its easy to imagine that trading these types of asset on exchanges will be required.

With this realisation, in the orderbook form of Serum DEX, dYdX etc, and the swap form of Uniswap, SushiSwap etc users will want another well used Block from TradFi: Algorithmic Execution.

Algorithmic Execution is the concept of breaking orders into smaller chunks and executing child orders over different timescales to achieve better prices.

1.2 Algorithmic Execution

Algorithmic Execution has its roots in the equities markets. As early as 1970s people were breaking large orders into smaller orders to ensure they did not move the market, ie so they got a better price. This evolved over time to the situation now where algos are a fundamental tool used worldwide by sophisticated traders who want the best price.

Using algos has multiple benefits:

- Trades are broken into smaller chunks so market impact is minimised, resulting in better prices
- The manual effort of managing a trade is reduced, instead of entering lots of small orders the algo does it
- Reduced risk of manual error from entering small trades
- Liquidity is sourced from multiple fragmented sources, taking the best price from those sources and reducing impact. Never wonder if you can get it cheaper somewhere else.
- Markets remain more stable and are less prone to liquidity shocks
- Algorithms can have pre defined risk controls that help maintain orderly markets, which is a regulatory goal.

Ultimately it boils down to cost and regulations. For the user they get a better price than if they sweep the market. For the market makers that take the other side they get smaller chunks of an order and so warehouse smaller risk. For regulators they can require risk controls that help contribute to orderly markets.

1.3 Decentralised

In the future where people have full control of their assets and are seeking best execution and prices, or the future where there are fund managers who specialise in managing peoples assets for higher returns the decentralised version of algorithmic execution and its associated value add services will arise.

This service will help drive orders to the decentralised versions that it trades on, from retail and institutional user bases.

2 AlgoDecentral

AlgoDecentral is the decentralised building Block that will provide executions services to all users so they can confidently achieve better prices. It will grow as technological advancements allow to be able to source liquidity from all fragmented sources. Initially

on Solana it will also source liquidity from Ethereum and other block chains, from orderbooks and from swap exchanges. Main components:

- ADEC: the token of AlgoDecentral
  - ADEC will be integrated to AlgoDecentral, with buy/burn and utilty for additional services provided by the ecosystem
- Trustless Execution
  - connect & trade directly from a wallet with no centralised counterparty risk
- Algorithmic Execution
  - A suite of algorithms to match user requirements
  - TWAP, POV, Float, Sweep, Implementation Shortfall
  - achieve best price, enhance trading returns
- Transaction Cost Analysis
  - a suite of tools to analyse a trade. Did the algo get best price
  - historical price recording
- Real Time Market Insight
  - a dashboard that provides real time insight
  - where is the volume,
  - what are the trading conditions like right now

3 ADEC

ADEC is anticipated to have the following utility:

- fees initially go to a SRM holding to reduce transaction costs for users of the system
- fees eventually start participating in a buy/burn once maximum cost reduction achieved
- holding ADEC allows use of other services in the AlgoDecentral ecosystem, such as transaction cost analytics and real time analytics
- full tokenomics tbd

4 Trustless Execution

Centralised exchanges in crypto require users to deposit funds with them. This introduces a counterparty risk of the exchange going bankrupt. AlgoDecentral will hold users tokens in a smart contract. The smart contract will be audited to ensure safety of users funds. By holding in a smart contract the counterparty risk is removed. Furthermore there will be no arbitrary thirdparty deciding whether funds have been transferred.

When an order is placed with AlgoDecentral funds are immediately transferred to the SC and authority to trade is given to the SC. An algo order is then created to manage those funds. The user maintains control of the algo and can cancel or amend at any point.

Once the order is in a terminal state (cancelled, filled) then the user can choose to settle back to their own wallet account.

The algo is responsible for placing the child orders on the market, and the user has full visibility of the progress of the order.

5 Algorithmic Execution

There are different types of algorithm that users require. These different algorithms are used for different purposes and are outlined below:

- TWAP – time weighted average price. This splits an order linearly over time. As a simple example an order for 10,000 SOL worked over 100 minutes may split the order into 500 child orders of 20 SOL, with an execution every 12 seconds. More sophisticated TWAP strategies will vary these parameters, but the intent would be to execute smoothly.

- POV – percent of volume. This strategy aims to participate in line with trading volumes in the market. If a user entered 10% the algo would look to see how much is trading. For every 100,000 traded the algo would seek to trade 10,000. This style of algo allows orders to trade when there is larger volume and so attempts to minimise risk
- Float – the float is a passive strategy that continually pegs a limit order to the top of the book. This way the user can continually earn the spread but doesn't have to continually repeg if the market moves away. If the market moves towards the order then the child order fills and a new order is placed.
- Sweep – the sweep strategy is an aggressive strategy designed to balance urgent trading but without causing market impact. When placing a standard limit order a user may experience a bad execution if the order is large and the limit is placed deep in the orderbook. The sweep will sweep across multiple exchanges in smaller sizes and then allow liquidity to replenish before sweeping again.
- Implementation Shortfall – this is an adaptive strategy that is designed to minimise the slippage from the arrival price. That is it minimises the difference between the mid price when the order is placed, and the actual execution price achieved. It can do this in multiple ways, by adapting to real time conditions, taking advantage of favourable price moves, opportunistically sourcing liquidity if it becomes available, detecting orderbook imbalances etc.

*please note: Algorithmic execution is not to be confused with Algorithmic Trading. Algorithmic Execution is solely for the purpose of achieving a price. It does not take any investment decision.

These algorithms can be selected by the user in their order entry system of choice. There will be an Api that trading UI builders integrate and use to send orders to AlgoDecentral. An on chain program is initially invoked that creates the algorithm, and then funds are transferred and ownership assigned to the program.

Since on chain computation is expensive there will be an off chain component that is listening to market data updates and conditionally deciding when/where to send orders. This off chain component will be the only component that can place child orders utilizing the users funds once the order is created.

The inherent goal of all these algorithms is to enhance trading returns for users, minimise impact and give greater control.

They also allow regulators to assess the quality of the risk controls and help prevent market manipulation abuses.

6 Transaction Cost Analysis

Transaction cost analysis is a value add service provided on all trades. There is full visibility and audit trail of of any child orders placed so that users can be assured that:

1. The algo is working as expected
2. The algo is achieving best execution

Best Execution is a concept in regulated MIFID instrument markets.

AlgoDecentral will have a portal where a user can access all their trades, retrieve all the trade history, and analyse the performance of the different algos. This will be a value add service with additional ADEC tokens unlocking more features.

There may be scenario simulations, and backtest results, for example expected price had an algo ran over time frame X. The aim of these will be to help users understand when to use an algo and help convince that they unlock superior returns.

7 Real Time Market Insight

As the market moves so can a trading or investment strategy. Real Time Market Insight will allow users to be able to adapt to any news events or to see flows and orderbook balances across all markets. This kind of insight requires data capture from various trading sources, from news feeds and requires insight into the crypto market patterns and correlations.

Capturing these events can lead to significant alpha for traders.

Again this is expected to require additional ADEC tokens to unlock.

8 About Us

AlgoDecentral is built by a team of TradFi Algo Trading specialists who have long maintained interest and small development projects in crypto markets.

Having worked closely with the execution desks and portfolio managers of the main asset managers we know what trading tools work, and we know how to adapt to changing environments.