



Purebet

A next generation decentralized sports betting exchange.

What is Purebet

Purebet is a decentralized, non-custodial sports betting exchange and prediction market based on the Solana blockchain, custom built from the ground up to give the optimal betting experience. The current build is an alpha/proof-of-concept version to demonstrate the power of building custom built smart contracts on the Solana blockchain designed specifically for sports betting.

Purebet allows anyone to express their opinion on any sporting event, political race, financial market, or any other prediction outcome without the worry have having to trust a 3rd party with their funds.

Purebet connects people with opposing views automatically and anonymously.

Market fit

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- Global sports betting volume is estimated at \$1.5 tr per year.
 - A large position is from Asia – \$600 bn from China, \$25 bn from USA.
 - Sports betting market CAGR is almost 10%, and ongoing legalisation in the USA will boost this.
 - The largest sports betting exchange, Betfair, handles £65 bn per year with ~2.5% of that captured by the platform in fees.
 - Betfair only operates in limited jurisdictions and with KYC'd users.
 - Almost all venues are limited by jurisdiction and have mandatory KYC to comply with local regulations.
 - No blockchain-based exchange has a real market presence.
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Traditional betting venues

- To use licensed sports betting venues, you must trust them to safeguard your personal details and images of sensitive information which they use to verify your identity. You must also trust them to control your funds appropriately, including processing payouts when requested – this does not always happen.
 - To use sportsbooks which accept cryptocurrencies as a payment method, you must trust unlicensed operators who have no legal obligations. You must trust they will remain solvent and not simply decide to steal your funds.
 - Both of these types of venues will stop taking action from users who consistently win. This can mean a user is left with no venues at all.
 - Some traditional sports betting exchanges exist but they are only available to people in specific jurisdictions and fees can be very high.
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How web3 fixes this

Through self custody and smart contracts, many of the issues with traditional venues are resolved since winning outcomes are resolved by an oracle network, profits are paid out algorithmically by smart contracts, and users do not need to stress over missing deposits and rejected withdrawals since funds only ever move between their own wallet and a smart contract.

Solana's low fees and ultra fast transaction confirmation times makes it the perfect blockchain to build a sports betting exchange on.

Current web3 venues

There are currently some web3 projects attempting to solve the issues however, they come with their own issues and technical debt due to not being designed from the ground up for an optimal sports betting experience.

- Polymarkets – Uses a $x*y=k$ AMM so requires passive LPs who are exposed to market movements without any control of their position.
- SX bet – Requires bridging assets and to deposit funds within their system in order to place bets.
- Hedgehog Markets – Uses parimutuel markets so users do not know what odds they will be getting when they place their bet.
- Aver Exchange/betDEX – both Solana based exchanges built on Serum orderbook which are yet to launch. Building on Serum can have limitations as it is not designed specifically for sports betting.

A deeper dive

Purebet is an exchange where users with opposing views can trade against each other in a trustless manner. It is not a peer-to-peer service where any user must find another specific user to trade against – all orders on an event are fungible and can be opposed by anyone else.

Users have the ability to select the odds they wish to get on their desired outcome, and if one or more other users wish to oppose them at these odds, the orders will be matched and locked in the smart contract until the event has resolved. The winner is then awarded their initial stake plus their winnings.

An example

Using the imaginary US election on the website, if Alice thinks Lincoln is likely to win and feels like odds of 1.5 are fair odds (meaning she gets a total return of 1.5x her initial stake), she would place an order of 1 SOL on Lincoln @ 1.5. Since no other user has placed a bet on this event yet, this order is a maker order and must be matched by someone who wants to oppose it. It shows as liquidity to back the opposite side, Washington, at the inverse odds, 3.0 and an available stake of 0.5 SOL – the amount needed to pay out Alice's profit.

Bob sees the market and thinks Washington's changes are greater than what odds of 3.0 implies. He backs Washington @ 3.0 with a stake of 0.1 SOL. Bob's 0.1 SOL and 0.2 SOL of Alice's bet are locked in the contract until the event is over since these bets have now matched. Charlie also likes odds of 3.0 for Washington and risks 0.2 SOL. This, plus 0.4 SOL of Alice's bet, are locked in the contract.

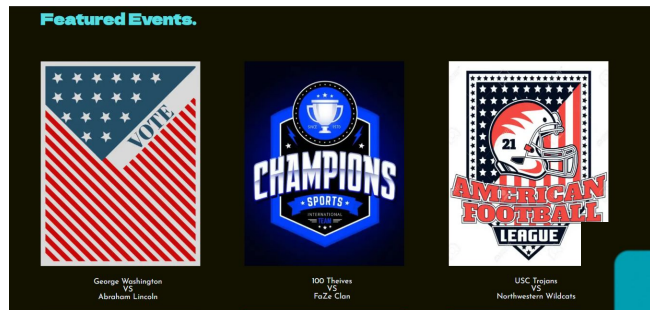
Example Continued...

At any point, more users could come along and match with the remainder of Alice's bet, locking it in the contract, or she could cancel the remainder of her order and have the 0.4 SOL returned to her wallet.

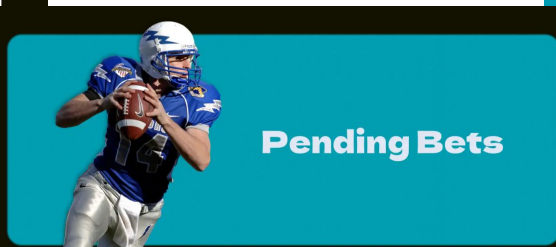
More users could place orders at higher odds on either side. This continues and a deep market forms with liquidity on both sides of the event. As new information enters the market, the available odds fluctuate as traders cancel their orders or match existing orders, locking the stakes in the contract.

Once the election is over, the traders who bet on the winning candidate get their initial stake and profit – which comes from the stakes of those on the losing candidate – out of the smart contract at the odds they placed their orders at.

Using Purebet



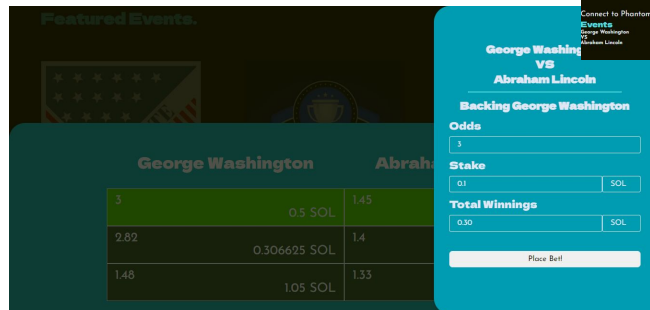
The main page of Purebet to display events. Click on an image to bet on that event.



Pending Bets

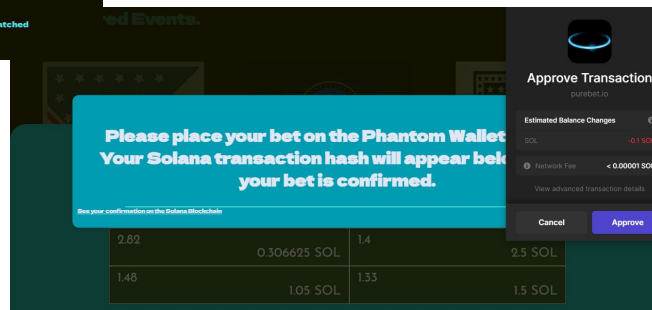


The market for each event appears once selected. Click on an offer to open the bet slip.



On the bet slip, the odds and stake can be adjusted. Once you place the bet, Phantom wallet will appear.

On the pending bets page, you can see all the orders you have placed.



Confirm the transaction on Phantom and the bet will hit the blockchain. Matched bets will be locked in the smart contract until the event is over.

Business model

- Purebet takes on no risk from users – all funds are from other users. In terms of purely the function of the protocol, Purebet has no costs other than deploying programs on-chain.
 - Traditional sports betting exchanges profit by taking up to 8% of a player's profits on every bet as a fee for matching their bets in order to cover their large operational overheads.
 - Purebet could, in theory, function without taking any fee. This means even a small fee of 1-2% on profits of winning bets is competitive compared with traditional venues, and drives revenue to the protocol.
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Incentive profile

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The cost to the protocol of matching \$1 of volume is exactly the same as matching \$1m of volume. However, these produce \$0.01 and \$10,000 of protocol profit, respectively. This means it is in the interest of Purebet to drive as much volume as possible. In order to drive high volume, the liquidity must be thick to allow traders to execute orders of a large size.

Thick liquidity means users get very competitive odds on the events they wish to bet on. This means they are more likely to bet with Purebet than another venue. Lower fees than traditional venues also push traders towards Purebet.

Users can be further incentivized through the distribution of a protocol governance token.

Governance token

A protocol governance token, PURE, can be distributed to users of the protocol. This can be gamified by distributing the token weekly based on a near-logarithmic function of trading volume and displaying the weekly trading volume leaderboard.

- Incentivizes users to trade more;
- Can be used by the user to offset the tx costs of on-chain trading;
- Distributes the token to the users who actually use the protocol;
- Does not give high-volume users too much control.
- No trading on the exchange would take place using PURE.

Token function

Besides incentivizing users, the token can allow users to contribute to the design and decisions of the protocol through governance. This ensures that the protocol develops in a way which benefits the users of the protocol.

Upon sufficient development of the protocol, it would be desirable to return protocol profit to token holders. The most effective method for this is direct dividends. Users would stake their PURE tokens within a smart contract which would then periodically distribute protocol profits pro rata.

This means token holders earn a yield not denominated in the protocol token.

Partnerships

- Key partnerships would be with Pyth or Switchboard to provide an oracle service for event creation and settlement.
 - NFT DAOs could partner with us to incentivize us to create floor price prediction markets to allow their holders to speculate or hedge on NFT prices.
 - Partnerships with options market makers would allow deep liquidity on coin price over/under markets as these are reformatted binary options.
 - We would form partnerships with users or DAOs who are looking to run market making or arbitrage bots to bridge our liquidity with other on-chain and off-chain venues.
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Risks

- Regulatory risk – gambling is illegal in some countries. Unlicensed gambling venues are illegal in most countries. It would be possible to block users from certain jurisdictions from the UI based on their IP address. However, it would be impossible to prevent them interacting directly with the programs deployed on the blockchain.
- Smart contract risk – any funds which have left user wallets would be at risk of programming errors. This could be mitigated by following Solana programming best practices and undergoing an audit.
- Lack of adoption – liquidity brings liquidity. Without sufficient user volume, it would be hard to attract new users. The use of automated arbitrage and market making bots can help populate orderbooks.

The team

We have a great mix of sports betting industry knowledge, technical skills, and crypto-native experience.

- Wesley (Backend): Matched bettor and self-taught Solana developer who currently attends UCLA.
- Aniket (Frontend): Frontend engineer beginning his adventure into web3 projects who currently attends IIITDM Jabalpur.
- Euan (Advisor): independent sports trader and crypto/defi fan.

Next steps

- Integrate trading with a stablecoins rather than SOL so traders aren't exposed to SOL price movements.
 - Develop and integrate an oracle system for automated event creation and trustless settlement.
 - Upgrade UI to handle more events and integrate price history and liquidity depth charts in the UI.
 - Develop an API/SDK to allow users to built market making and trading systems which plug straight into the on-chain programs.
 - Build community of crypto-native, first-time bettors and experienced sports bettors getting their first web3 experience through educational content and community events.
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Definitions

- Sportsbook – a platform run by a bookmaker who takes all liabilities of users' bets.
- Sports betting exchange – a platform which facilitates the matching of opposing bets from different users.
- To match orders – similar to financial exchanges matching buy and sell orders, orders on sports betting exchanges must be between users who back opposite outcomes.
- Prediction market – as above but focused on non-sporting events.
- Parimutuel markets – user funds from each side of a bet are pooled together and split pro rata to those who backed the winner. The profit to initial investment ratio is not known until the market closes.
- Peer-to-peer betting – arranging a bet between just 2 people, like between friends at the bar.
- Odds – the ratio of between the potential profit and initial risk. Decimal/"European" odds are always greater than 1.0 and reflect the ratio of initial risk to total returns.
- Stake – the initial risk of a bet.

Thank You!
