Project Proposal (Refinement)

PokerChain

Decentralizing Fair Play in Online Poker

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Project Description

Online poker popularity has increased over the years, but with this growth come significant challenges. Centralized poker platforms have raised concerns among players due to the inherent need to trust these platforms to operate fairly. Historically, there have been accusations of cheating, game manipulation, non-transparent game mechanics that could affect not only the core gameplay but also the third parties like betting game outcomes. Moreover, players often experience payment delays, due to traditional banking processes.

Our proposed solution is a blockchain-powered poker platform. This decentralized system leverages the intrinsic properties of blockchain technology to reestablish trust and transparency. By utilizing smart contracts, each game or tournament operates with guaranteed fairness, and payouts become automatic and instantaneous. The platform introduces a decentralized Random Number Generation (RNG) protocol, ensuring every player that card distribution is random, transparent, and verifiable. Furthermore, payments become seamless and swift as players can employ cryptocurrencies for their game buy-ins and promptly receive their winnings directly in their wallets, instead of using traditional banking holdups. Every poker hand played will be indelibly recorded on the blockchain, offering an unprecedented level of transparency. This approach also provides robust anti-collusion measures, harnessing the blockchain's capabilities to vigilantly monitor player behaviors and highlight any anomalies.

The necessity for Distributed Ledger Technology (DLT) or blockchain in this application is manifold. It offers an immutable record, ensuring that every game action, from the cards dealt to the chips won, is permanently recorded. The decentralization inherent in blockchain removes the concerns of a centralized authority, which can be a vulnerability in terms of both system failure and possible game manipulation. The cryptographic strength of blockchain also ensures heightened security for player data, game outcomes, and account balances. Most crucially, it creates a trustless gaming environment. Players no longer need to place faith in the platform but can rely on the incorruptible technology itself. Through smart contracts and decentralized RNGs, the system guarantees equitable play and immediate financial transactions, a marked improvement over traditional platforms

Project Design
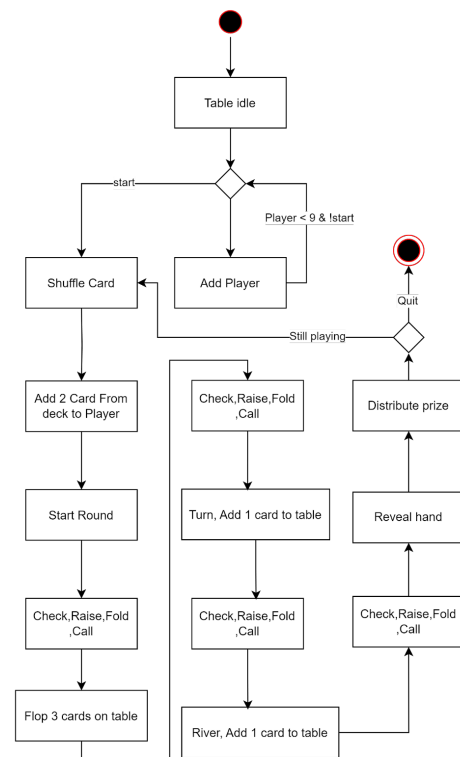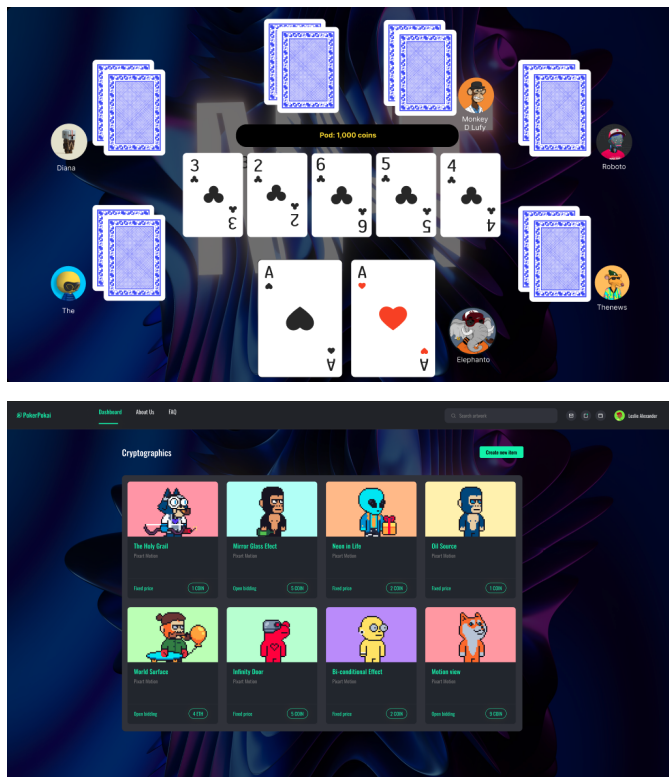
Core Gameplay and Design

Poker is a classic card game focused on betting and individual play, where players bet on the strength of their card combinations (known as "hands") and engage in a strategic battle of wits. Each game involves rounds of betting, where players can bet, check, call, raise, or fold, depending on their hand and their reading of the game dynamics. The game advances through these rounds until players either fold or reveal their cards in a showdown, with the highest-ranking hand taking the pot. Various poker variants exist, like Texas Hold'em and Omaha, but they all maintain this fundamental structure and objective. Despite the platform's technological underpinnings, our blockchain-based system preserves the traditional gameplay of poker, aiming to enhance user experience by ensuring fairness, transparency, and security in operations, without altering the essence of the game.

However, our PokerChain introduces additional features rather than the original poker gameplay.

- NFTs for Digital Collectibles and Rewards: We introduce unique digital collectibles that players can use as their avatars. This limited NFT reflects player achievements or status, which players can earn, purchase, showcase, or trade.
- Enhanced Fair Play Monitoring: We want to use blockchain's transparency to introduce a community-driven fair play system. The flagged game can be reviewed by community arbiters to ensure fairness gameplay.
- Earn More by Playing: We introduce a staking pool which will allow players to stake their in-game earnings into the pool, giving additional interest to players to encourage players actively playing in the platform.

Implementation

PokerChain will use a hybrid system, integrating blockchain's transparency with traditional systems. We utilize Ethereum's smart contracts for unbiased game logic and instant transactions, while user management remains conventional for optimal interaction and compliance. This synergy ensures a secure, fair, and user-centric poker experience. Each component can be broken down into the following.

- User part: This involves user registration and profile management. In this part, we will not use DLT.

- Game logic part: This core component dictates the gameplay mechanics, including card shuffling, dealing, game progression (bets, folds, calls), and win determinations. We will use Etherrum's smart contract to represent and progress through the state of the game.
    - Card Shuffling and Dealing: This involves Random Number Generation (RNG) within smart contracts to ensure complete randomness and fairness in card distribution.
    - Game Progression: Each player's actions are submitted as transactions on the Ethereum network. The smart contract processes these transactions in ensuring game rules are followed precisely and keep the state of the game progressing.
    - Win Determinations: The smart contract automatically performs this evaluation at the end of each game, ensuring an unbiased outcome. The contract then immediately triggers the transfer of the pot to the winning party.
    - State Verification and Error handling: All stages of the game are recorded on the blockchain, allowing any participant or external auditor to verify the game's state at any time.

- Transaction part: This encompasses all financial transactions, including user deposits and withdrawals, bet placements, prize distributions, also NFTs. We will also use Ethereum's smart contracts to handle all of these transactions.

As for the smart contract, we will use solidity language to implement smart contracts that work on every state of gameplay. Multiple contracts will be implemented to manage different aspects of the game. For example, one contract could manage the game state, while another could handle shuffling and dealing cards. We might test and deploy using Remix.