Architectural Design - Payra

Payra Overview

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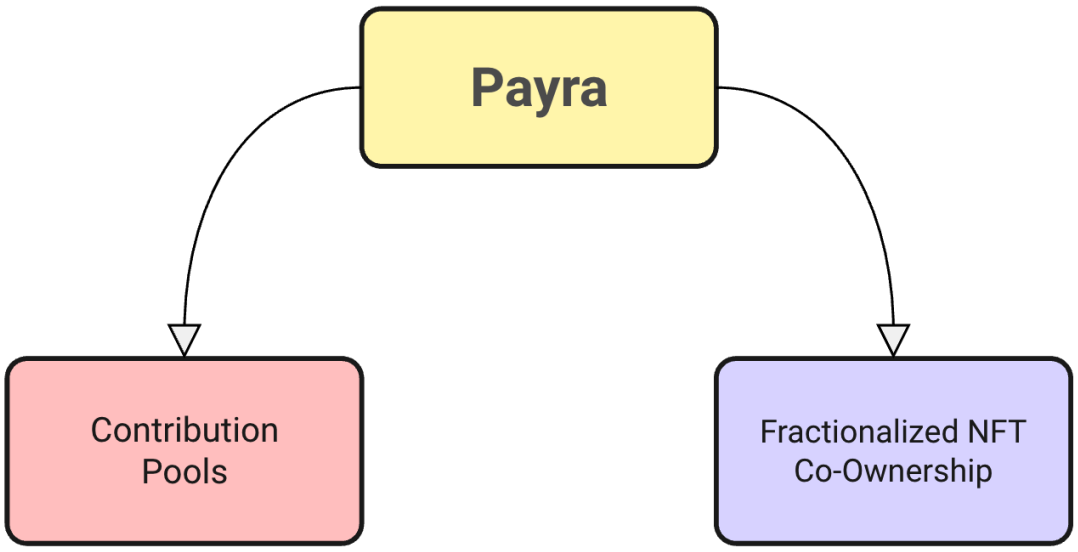
1. Contribution Pools

This service will allow users to split bills. The amount will be collected upfront. Then, based on DAO-style voting, the expenses can be added. At the end, the settlement will adjust all balances accordingly.

2. Fractionalized NFT Ownership

This service will allow users to purchase NFTs with fractionalized ownership. For example, a few users can collectively purchase a blue-chip, expensive NFT with their contributions. Their contributions will be recorded, and based on their voting, the NFT can be sold or someone can buy someone else's ownership. The rewards from the NFT or its benefits will be shared according to the fractional percentage of ownership.



Protocol POC Requirements

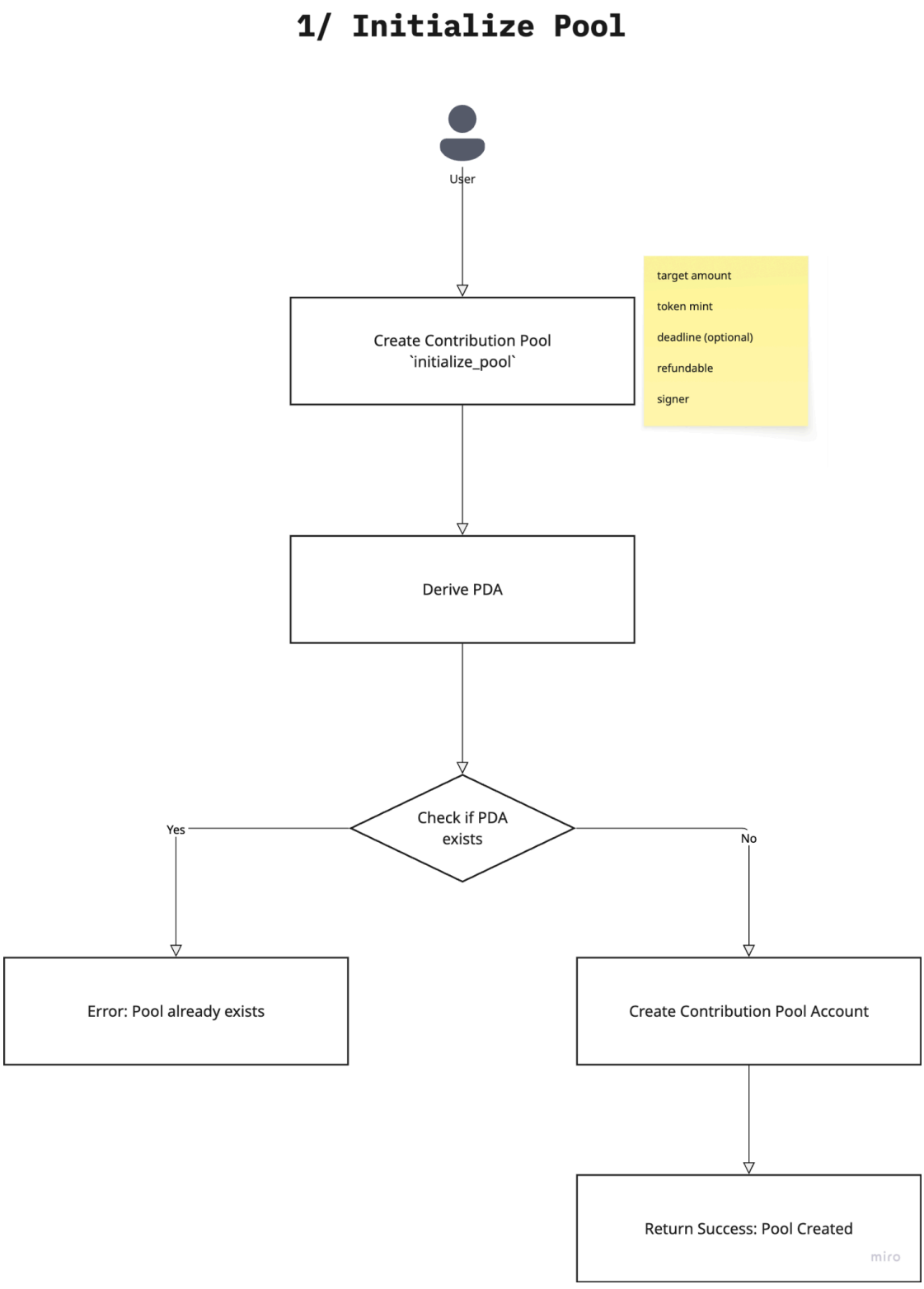
1. Contribution Pools

- The protocol shall allow a user to create a new event pool with a unique identifier
- The protocol shall allow a user to specify a target contribution amount for the event
- The protocol shall allow a user to invite or whitelist other users to contribute
- The protocol shall allow multiple users to deposit USDC tokens into the event vault
- The protocol shall record each contributor’s wallet address and contribution amount
- The protocol shall allow an event coordinators to propose expense transactions for acceptance
- The protocol shall allow the participants to vote on the proposal, any denying vote should reject the proposal
- The protocol shall record all withdrawals and link them to submitted expense metadata
- The protocol shall allow anyone to view current vault balance and expense history
- The protocol shall redistribute remaining vault funds to contributors pro-rata on completion
- The protocol shall refund full contributions to users if the event is cancelled
- The protocol shall allow contributors to trigger a "Finalize Vault" action for settlement
- The protocol shall support optional deadline for event expiry and forced settlement

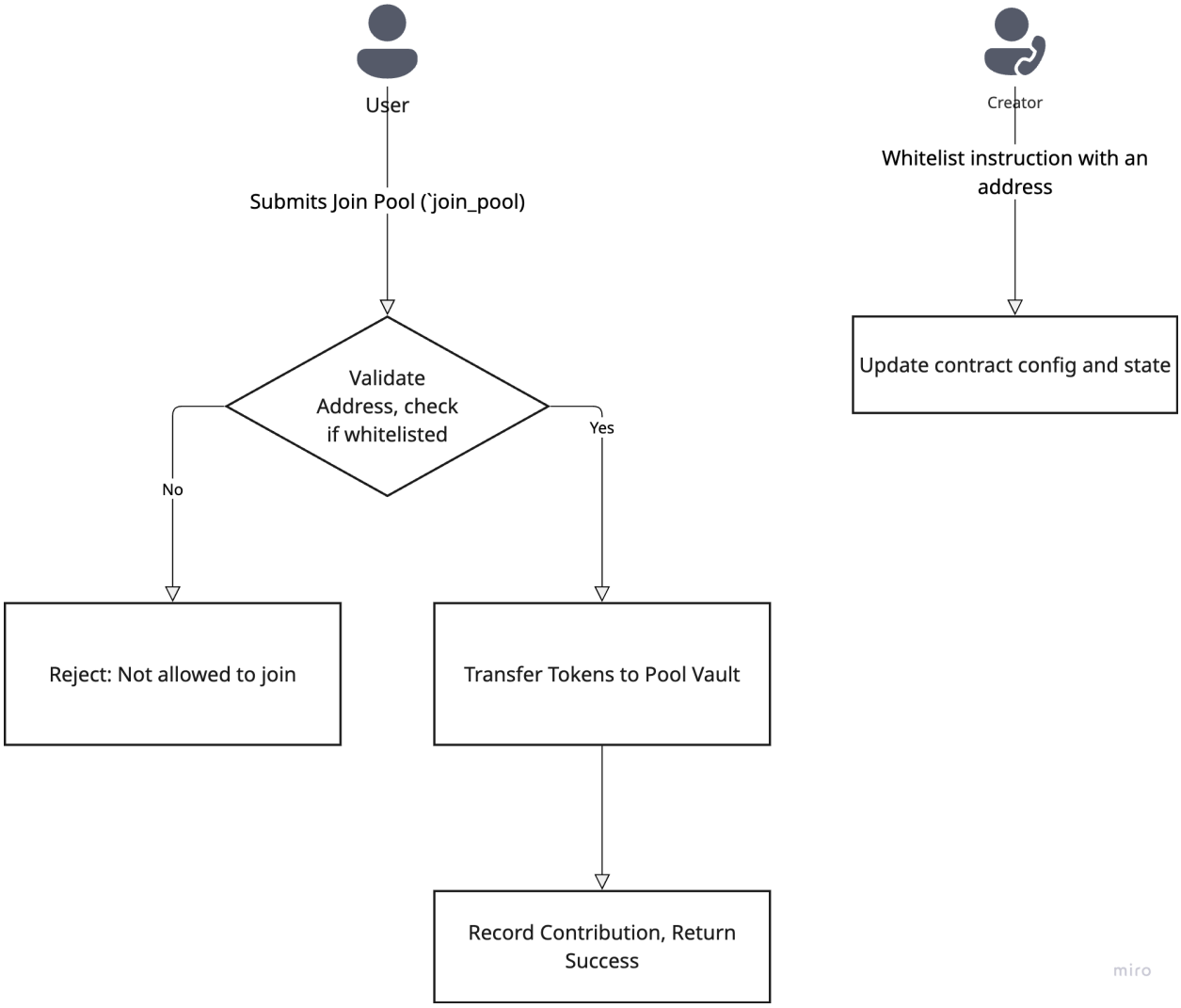
2. Fractionalized NFT Co-Ownership

- The protocol shall allow a user to create a new Collective NFT Pool with a target NFT
- The protocol shall allow a user to specify total required funding and number of shares
- The protocol shall allow multiple users to deposit SOL/USDC to fund the pool
- The protocol shall mint SPL fractional tokens to each user based on contribution share
- The protocol shall track each user's fractional ownership via token balances
- The protocol shall allow the PDA to initiate a purchase transaction for the target NFT
- The protocol shall transfer the purchased NFT to the CollectiveNFTPool PDA custody
- The protocol shall allow external revenue (e.g. royalties) to be sent to the pool's escrow
- The protocol shall record all incoming revenue and update the pool’s balance
- The protocol shall allow any user to trigger a revenue distribution function
- The protocol shall distribute revenue to fractional token holders based on share ratio
- The protocol shall allow the fractional holders to initiate a vote to sell the NFT
- The protocol shall allow the PDA to list and sell the NFT on a marketplace
- The protocol shall receive sale proceeds into the pool’s escrow account
- The protocol shall allow triggering a "Liquidate Pool" function after sale
- The protocol shall burn fractional tokens and distribute sale proceeds pro-rata

Below are the instruction/action based architecture diagrams for the Collection Pool service:



2/ Joining Pool



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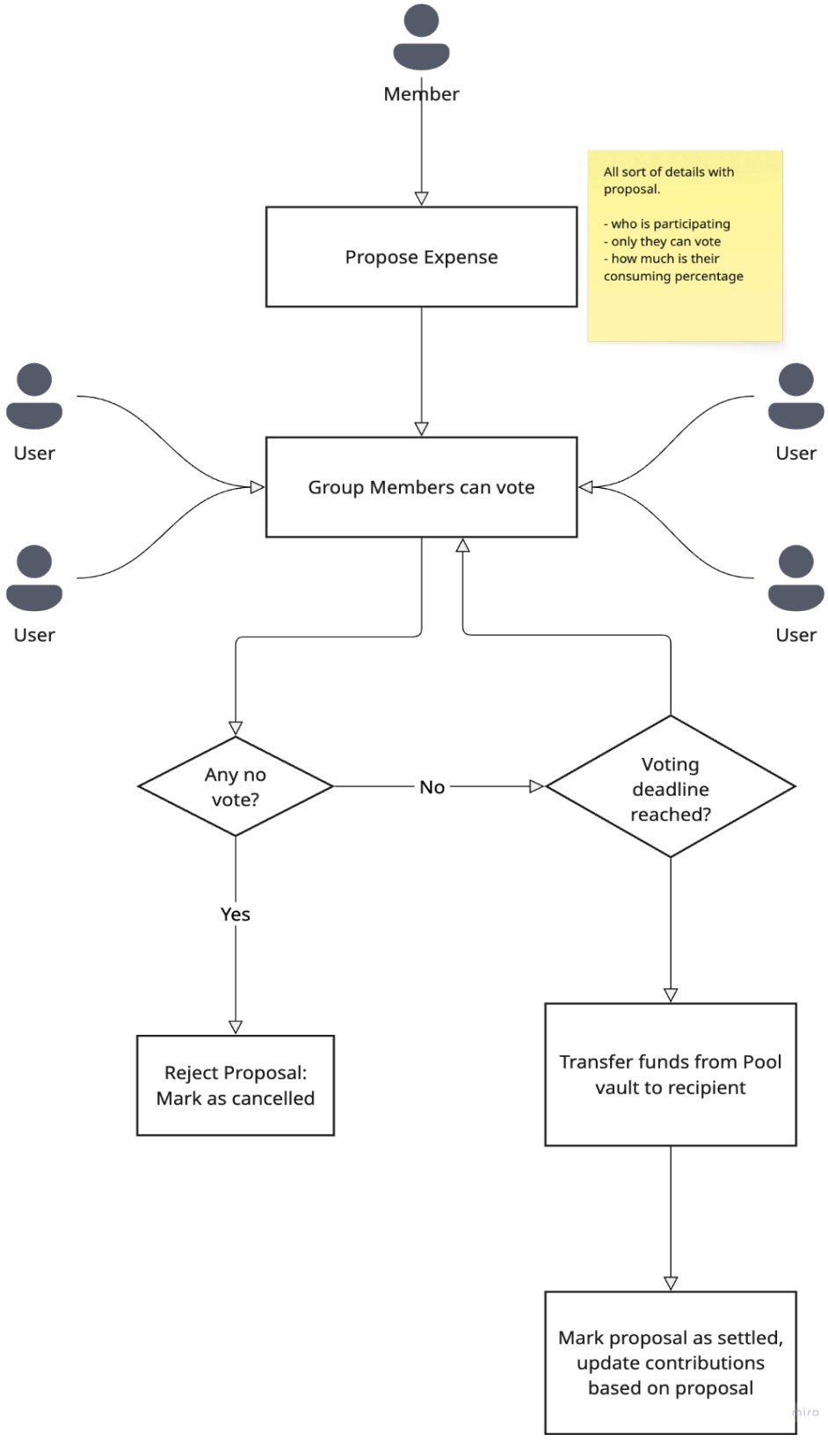
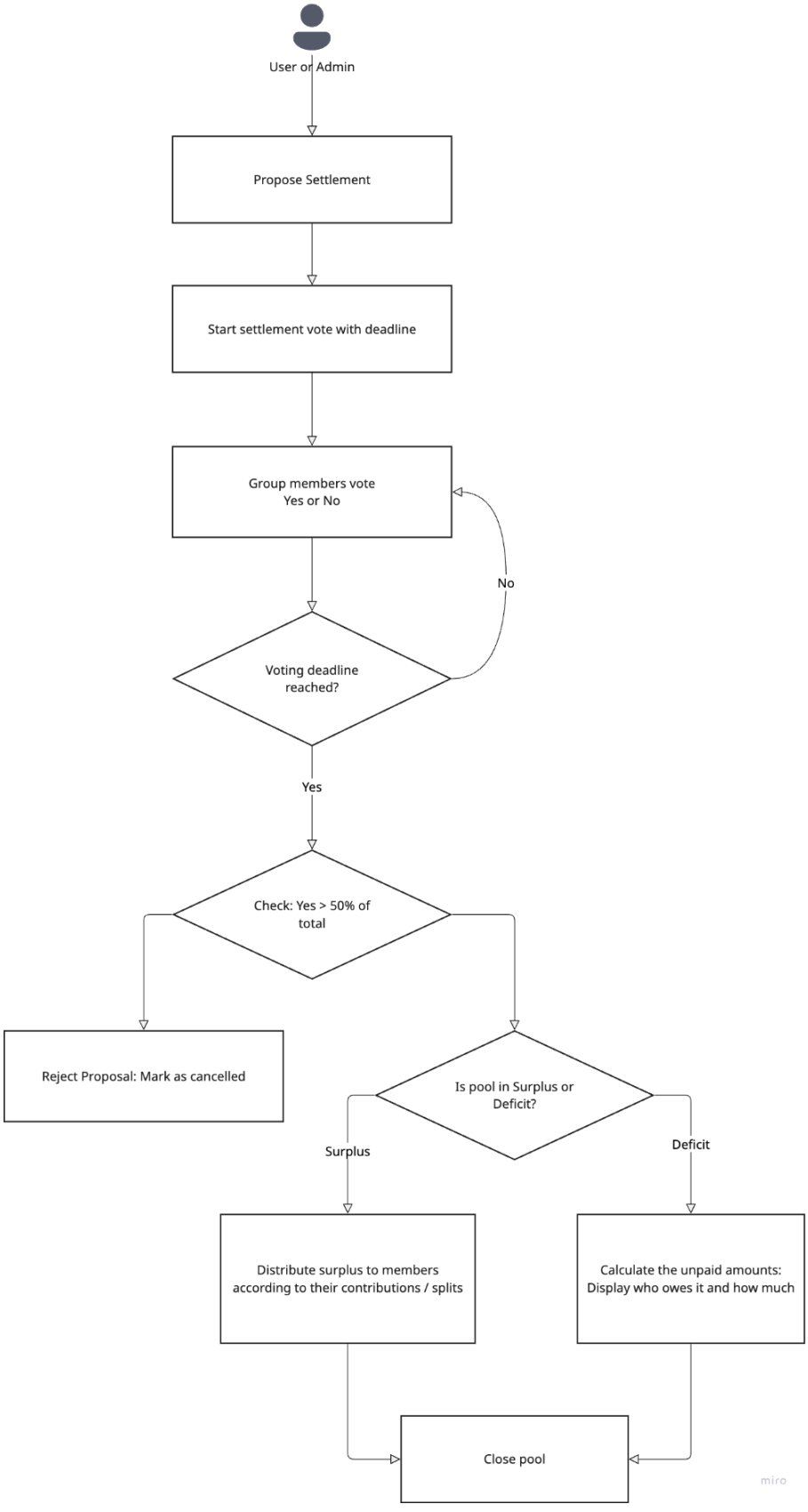
3/ Expense Proposals



4/ Settlement