

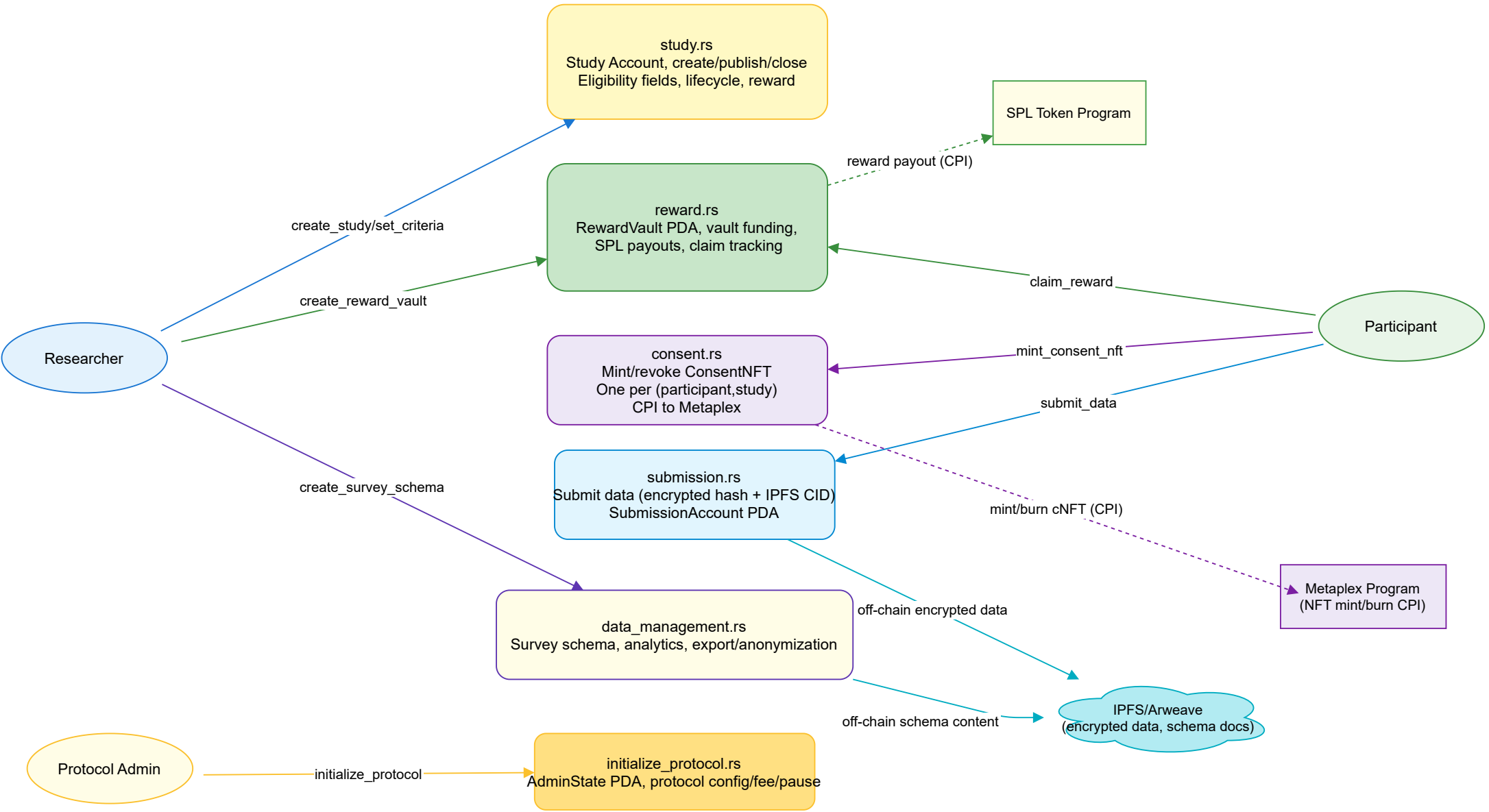
RecruSearch Architecture Diagrams

RecruSearch Protocol Requirements

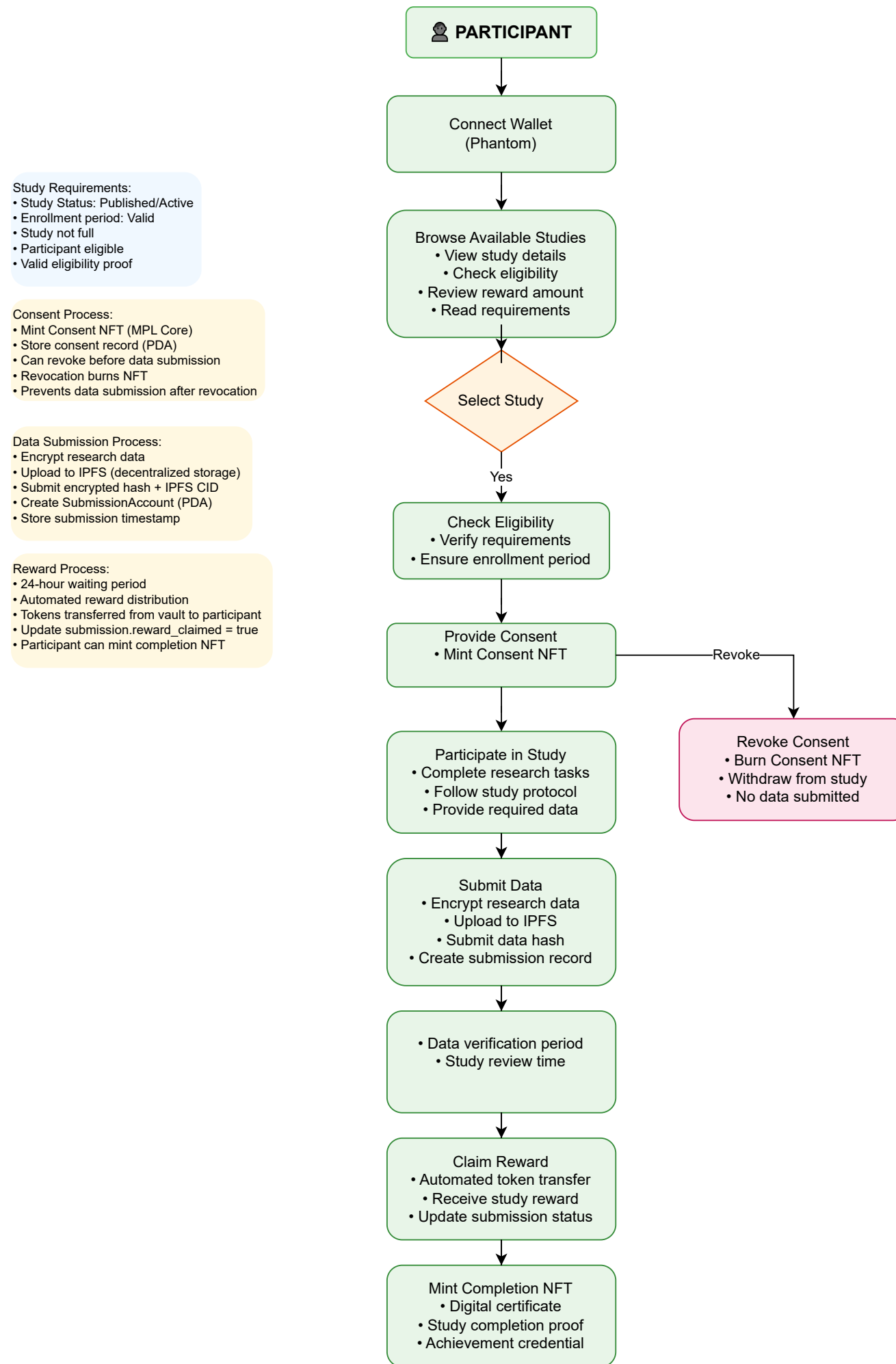
Core Protocol Functionality

- The protocol shall allow researchers to create and publish research studies with defined parameters (enrollment periods, reward amounts, participant limits)
- The protocol shall allow researchers to fund reward vaults with SPL tokens for participant compensation
- The protocol shall allow participants to browse available studies and enroll in them
- The protocol shall require participants to provide digital consent through NFT minting before participation
- The protocol shall allow participants to submit encrypted research data with IPFS CID storage
- The protocol shall automatically distribute rewards to participants upon successful data submission completion
- The protocol shall enforce study lifecycle management (Draft → Published → Active → Closed → Archived)
- The protocol shall implement end-to-end encryption for all participant data submissions
- The protocol shall store encrypted data off-chain using IPFS/ for privacy protection
- The protocol shall enforce consent revocation capabilities through NFT burning
- The protocol shall allow researchers to monitor study progress and participant enrollment
- The protocol shall enforce study closure when enrollment or data collection periods expire

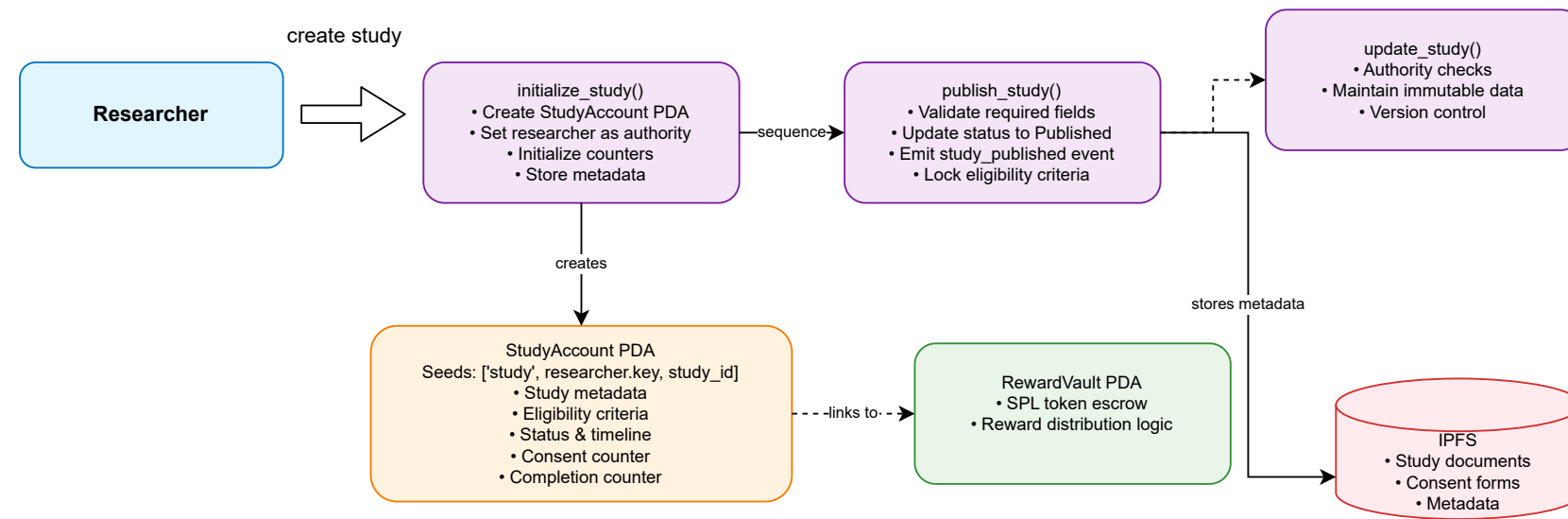
RecruSearch Protocol Overview



Participant User Flow



Researcher User Flow



Legend



Study Flow

Accounts Used:

CreateStudy:
• study: Account StudyAccount (PDA)
• researcher: Signer
• system_program: Program System

PublishStudy:
• study: Account StudyAccount (PDA)
• researcher: Signer

CloseStudy:
• study: Account StudyAccount (PDA)
• researcher: Signer

TransitionStudyState:
• study: Account StudyAccount (PDA)
• clock: Sysvar Clock

Legend

Instruction

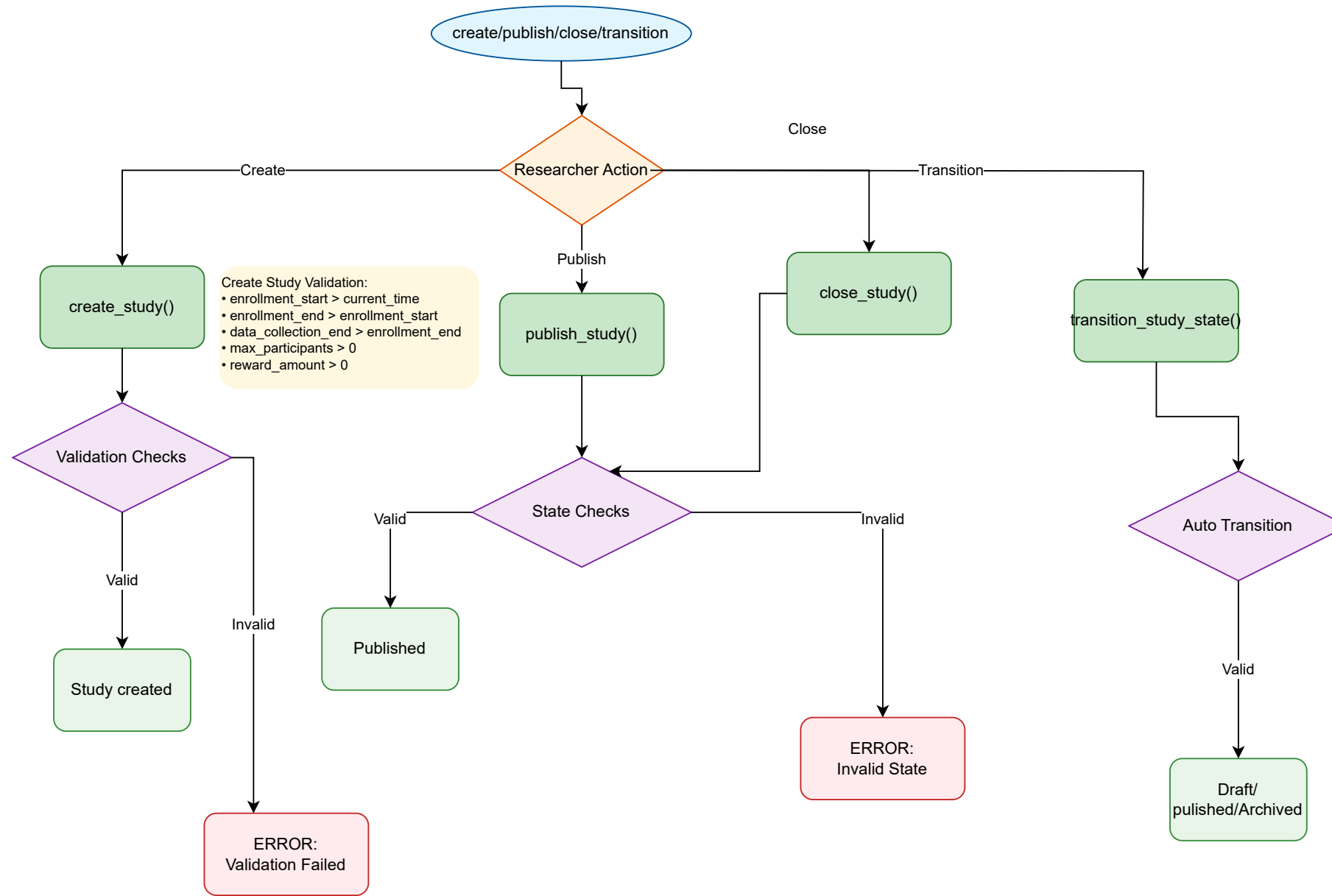
Decision

Function

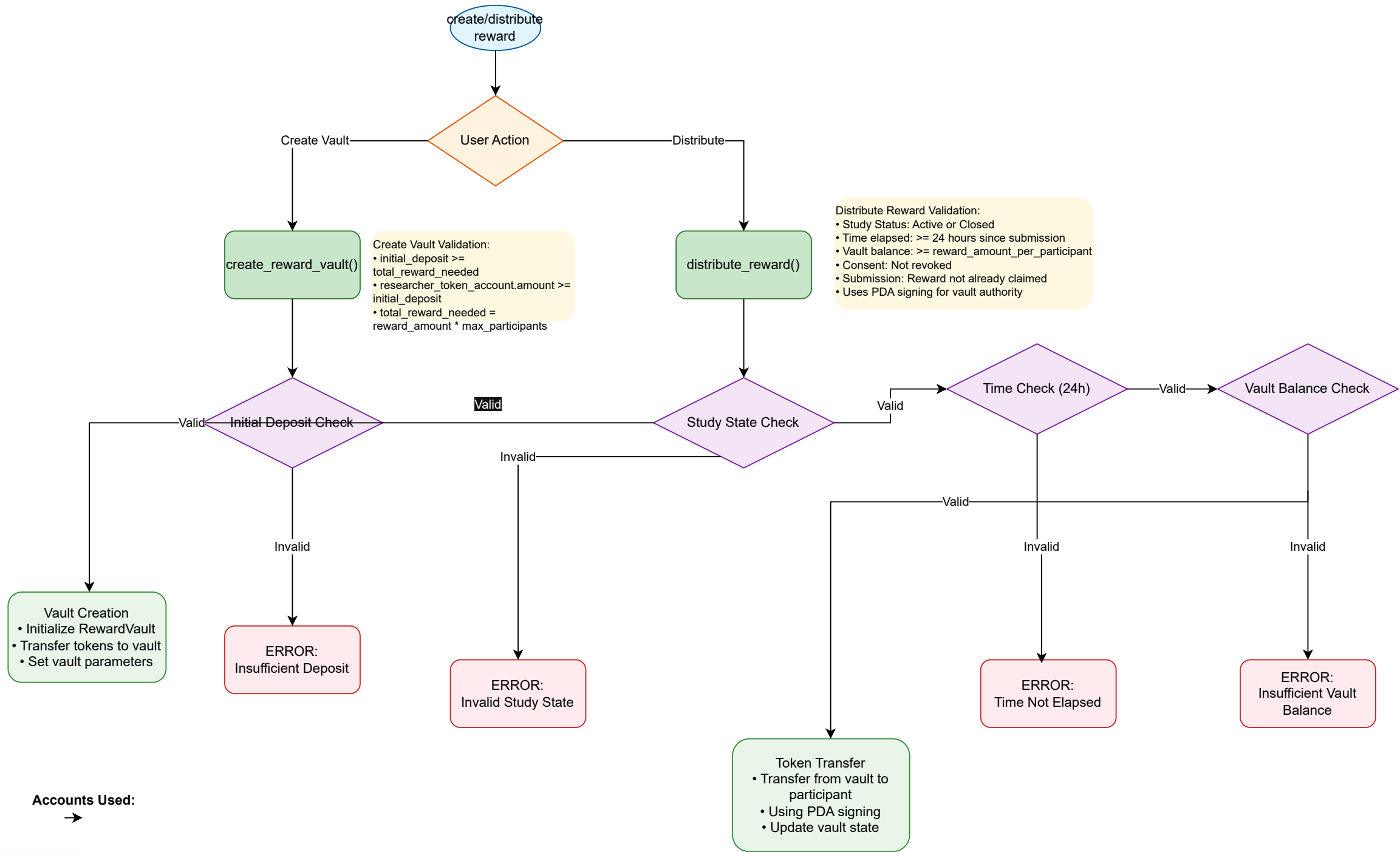
State

NFT
Operation

Error



Reward Management



Create Vault Validation:

- initial_deposit >= total_reward_needed
- researcher_token_account.amount >= initial_deposit
- total_reward_needed = reward_amount * max_participants

Distribute Reward Validation:

- Study Status: Active or Closed
- Time elapsed: >= 24 hours since submission
- Vault balance: >= reward_amount_per_participant
- Consent: Not revoked
- Submission: Reward not already claimed
- Uses PDA signing for vault authority

Accounts Used:



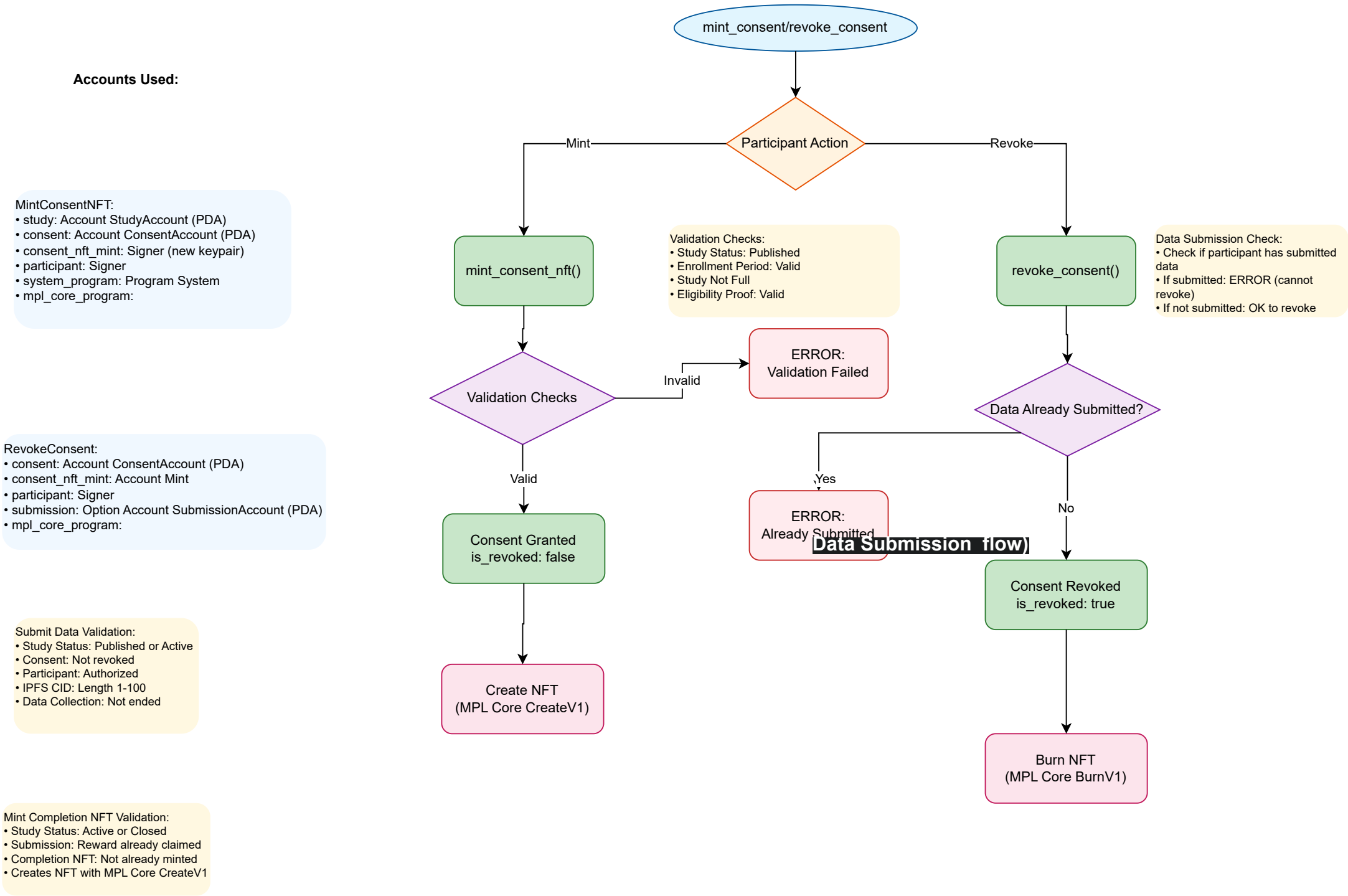
CreateRewardVault:

- study: Account StudyAccount (PDA)
- reward_vault: Account RewardVault (PDA)
- vault_token_account: InterfaceAccount TokenAccount
- reward_token_mint: InterfaceAccount Mint
- researcher_token_account: InterfaceAccount TokenAccount
- researcher: Signer
- associated_token_program: Program AssociatedToken
- token_program: Interface TokenInterface
- system_program: Program System

DistributeReward:

- study: Account StudyAccount (PDA)
- reward_vault: Account RewardVault (PDA)
- vault_token_account: InterfaceAccount TokenAccount
- consent: Account ConsentAccount (PDA)
- submission: Account SubmissionAccount (PDA)
- reward_mint: InterfaceAccount Mint
- participant_token_account: InterfaceAccount TokenAccount
- participant: UncheckedAccount
- researcher: Signer
- associated_token_program: Program AssociatedToken
- token_program: Interface TokenInterface
- system_program: Program System

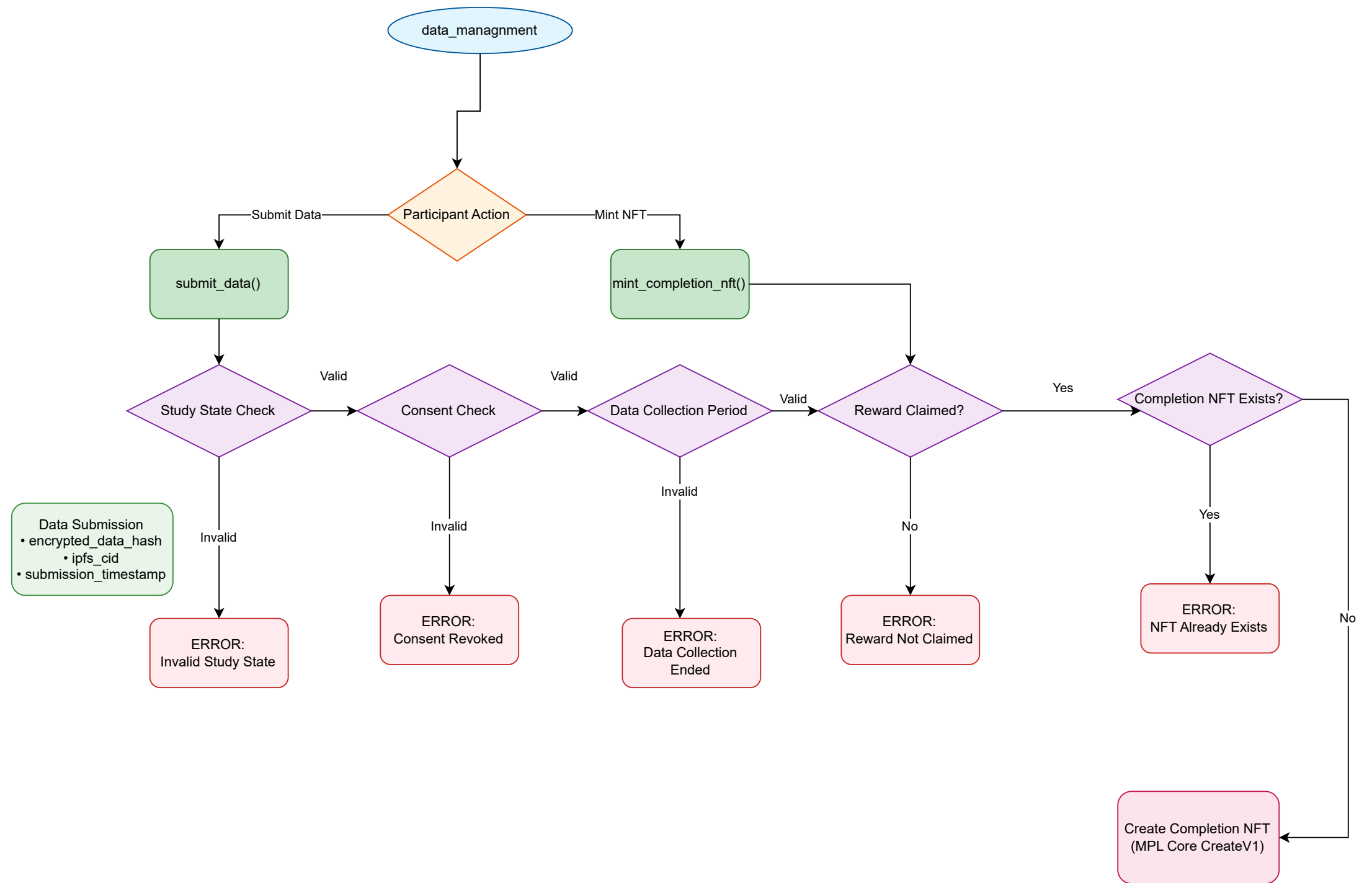
Consent Management



Accounts Used:

MintCompletionNFT:
• study: Account StudyAccount (PDA)
• submission: Account SubmissionAccount (PDA)
• completion_nft_mint: Signer (new keypair)
• participant: Signer
• system_program: Program System
• mpl_core_program: UncheckedAccount

SubmitData:
• study: Account StudyAccount (PDA)
• consent: Account ConsentAccount (PDA)
• submission: Account SubmissionAccount (PDA)
• participant: Signer
• system_program: Program System



SubmissionProgram Instructions Flow

