

Wiki Contribution Token (WCT) System - High Level Design

1. System Overview

The Wiki Contribution Token (WCT) is a Solana-based incentive system designed to reward high-quality contributions to a wiki platform. The system tokenizes contributions, enables staking for additional benefits, and provides a governance mechanism for community decision-making.

1.1 Key Components

1. Smart Contracts (On-chain)

- Token Contract: Implementation of the SPL token with tokenomics rules
- Staking Contract: Allows token holders to lock tokens for rewards
- Governance Contract: Enables proposal creation and voting

2. Backend Services (Off-chain)

- Contribution Tracking: Records and scores wiki contributions
- Reward Calculation: Determines token rewards based on quality and engagement
- Authentication: Verifies user identity and wallet ownership
- Weekly Distribution: Periodically distributes tokens based on contribution points

3. Frontend Application

- Wallet Integration: Connects to Solana wallets like Phantom and Solflare
- Contribution Dashboard: Displays user stats, points, and earnings
- Staking Interface: Enables users to stake tokens for variable periods
- Governance Portal: Allows users to create and vote on proposals

1.2 Key User Journeys

1. Content Creation and Rewards

- User creates/edits wiki content
- System assigns points based on contribution quality, user reputation, and content demand
- Weekly distribution converts points to WCT tokens

2. Token Staking

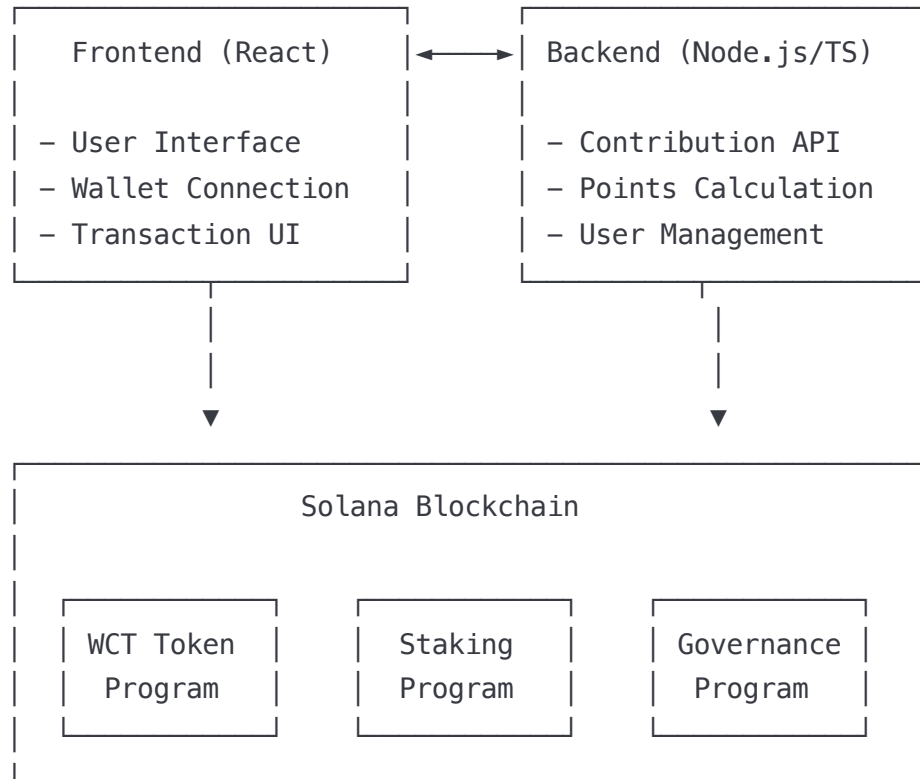
- User stakes WCT for a selected period (30/90/180/365 days)
- User receives reputation multiplier and voting power
- User earns staking rewards over time

3. Governance Participation

- Token holder creates a proposal (requires min. 1,000 WCT staked)
- Community votes on the proposal during voting period
- If approved, proposal is executed after waiting period

2. Architecture

2.1 System Architecture Diagram



2.2 Data Flow

1. Contribution Flow

- User creates or edits wiki content through frontend
- Backend API records contribution details
- Quality assessment algorithm assigns base points
- Points are multiplied by quality, reputation, and demand factors
- Weekly script distributes tokens based on accumulated points

2. Staking Flow

- User connects wallet and stakes tokens

- Staking contract locks tokens for selected period
- User receives reputation boost based on stake duration
- Staking contract distributes rewards from transaction fees
- After lock period, user can withdraw tokens and rewards

3. Governance Flow

- User creates proposal by staking required tokens
- Proposal data stored on-chain with execution payload
- Users vote during voting period based on voting power
- If quorum reached and majority approves, proposal is executable
- After execution delay, proposal can be implemented

3. Technical Components

3.1 Smart Contracts (Solana Programs)

3.1.1 WCT Token Program

- **Purpose:** Manages token creation, distribution, and transactions
- **Key Functions:**
 - Token creation with fixed supply (100M)
 - Initial distribution to allocation wallets
 - Transfer with fee mechanism (2% fee: 20% burn, 50% treasury, 30% staking)

3.1.2 Staking Program

- **Purpose:** Enables token locking for rewards and benefits
- **Key Functions:**
 - Lock tokens for fixed periods (30/90/180/365 days)

- Calculate and distribute rewards
- Apply reputation multipliers
- Manage voting power for governance

3.1.3 Governance Program

- **Purpose:** Facilitates community decision-making
- **Key Functions:**
 - Proposal creation and management
 - Voting mechanism with weighted votes
 - Proposal execution logic
 - Treasury fund allocation

3.2 Backend Services

3.2.1 Contribution Service

- **Purpose:** Tracks and evaluates wiki contributions
- **Components:**
 - Contribution recording API
 - Quality assessment algorithms
 - Point calculation with multipliers
 - Anti-gaming mechanisms

3.2.2 Reward Distribution Service

- **Purpose:** Converts points to tokens and distributes rewards
- **Components:**
 - Weekly batch processing

- Point-to-token conversion
- Bulk token distribution
- Transaction verification

3.2.3 User Service

- **Purpose:** Manages user accounts and reputation
- **Components:**
 - Wallet authentication
 - User profile management
 - Reputation calculation
 - Activity tracking

3.3 Frontend Application

3.3.1 Wallet Connection

- **Purpose:** Interfaces with Solana wallets
- **Components:**
 - Multiple wallet support (Phantom, Solflare, etc.)
 - Transaction signing
 - Balance checking
 - Transaction history

3.3.2 Contribution Dashboard

- **Purpose:** Visualizes user activity and rewards
- **Components:**
 - Contribution history

- Point accumulation stats
- Token earnings tracker
- Reputation multiplier display

3.3.3 Staking Interface

- **Purpose:** Enables token staking operations
- **Components:**
 - Staking period selection
 - Benefit visualization
 - Reward claiming
 - Unstaking functionality

3.3.4 Governance Portal

- **Purpose:** Facilitates proposal creation and voting
- **Components:**
 - Proposal submission form
 - Voting interface
 - Proposal status tracking
 - Execution monitoring

4. Implementation Phases

4.1 Phase 1: Foundation (Months 1-2)

- Develop WCT token contract
- Implement token distribution mechanisms

- Design database schema for tracking contributions
- Build initial frontend with wallet integration

4.2 Phase 2: Core Functionality (Months 3-4)

- Implement staking program
- Develop contribution metrics and points engine
- Create engagement tracking system
- Build user dashboard for contribution visualization

4.3 Phase 3: Advanced Features (Months 5-6)

- Implement governance system
- Develop treasury management
- Create dynamic reward pools
- Enhance reputation system

4.4 Phase 4: Scaling & Ecosystem (Months 7-9)

- Establish liquidity pools
- Develop partner integrations
- Implement economic monitoring
- Launch on mainnet

5. Security Considerations

5.1 Smart Contract Security

- Multiple security audits
- Economic attack vector analysis

- Rate limiting and threshold controls
- Treasury access restrictions

5.2 Backend Security

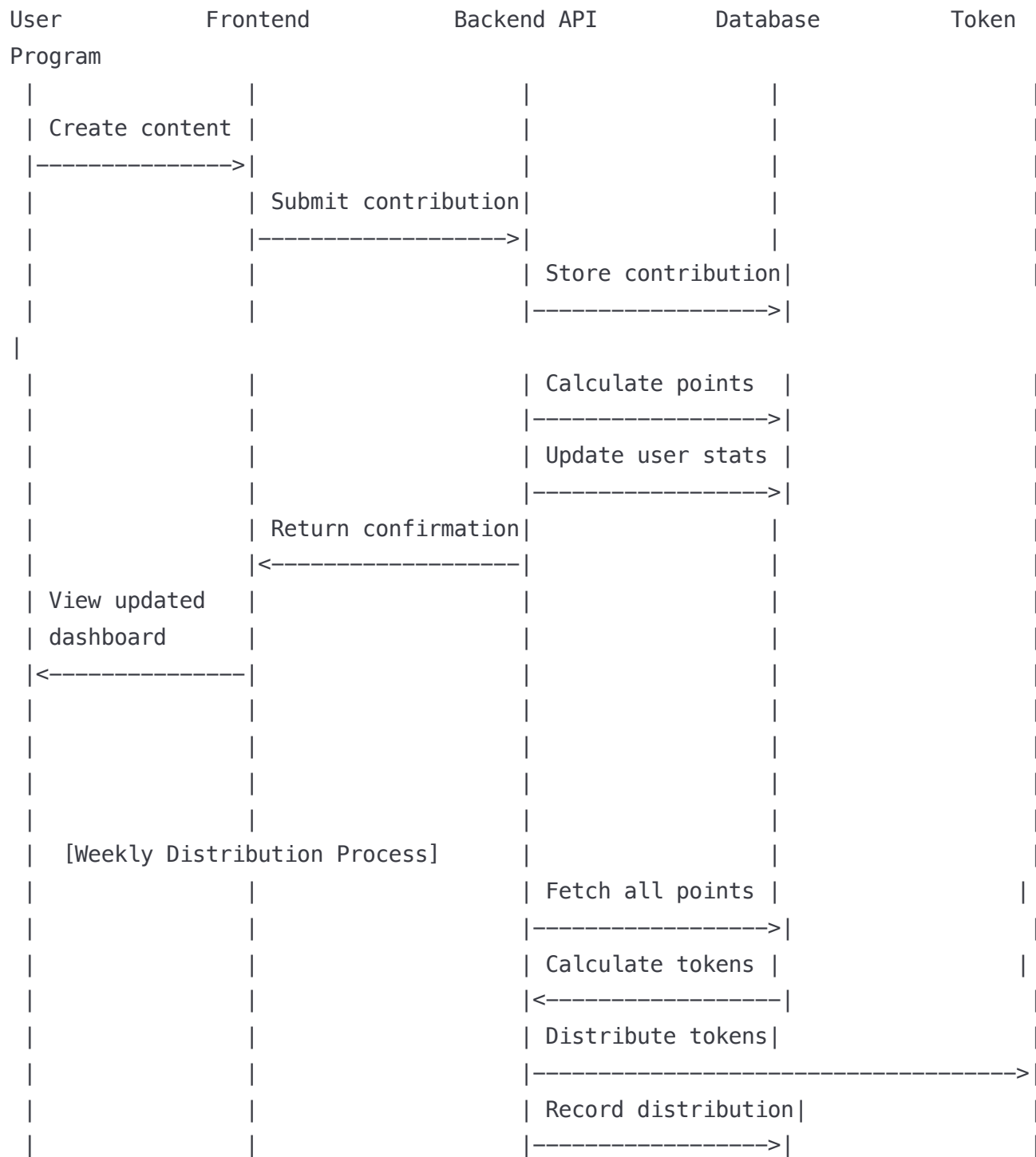
- Authentication and authorization mechanisms
- Rate limiting to prevent spam
- Input validation and sanitization
- Anti-gaming detection algorithms

5.3 Frontend Security

- Secure wallet connections
- Transaction confirmation UI
- Error handling
- Data validation

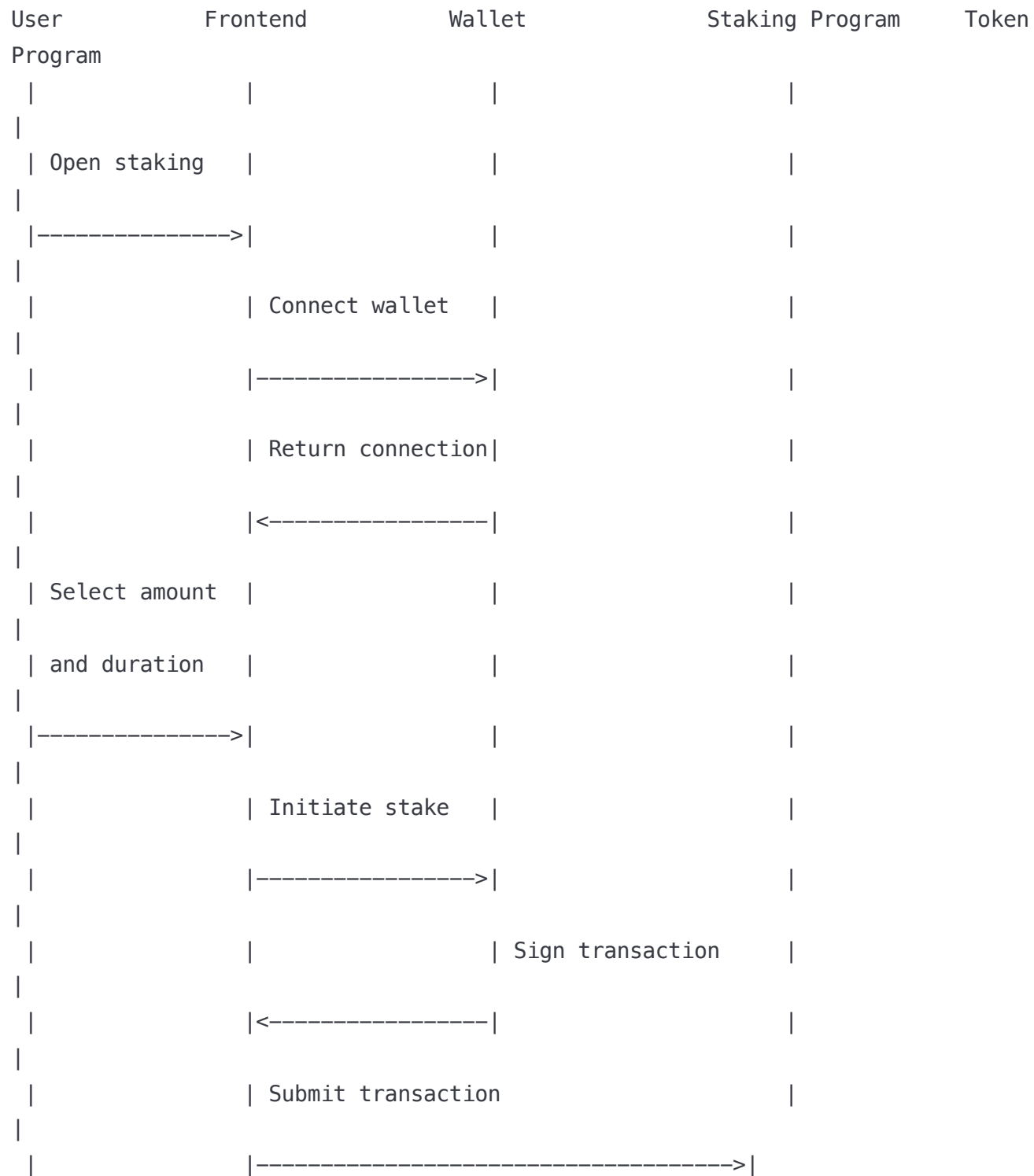
6. Sequence Diagrams

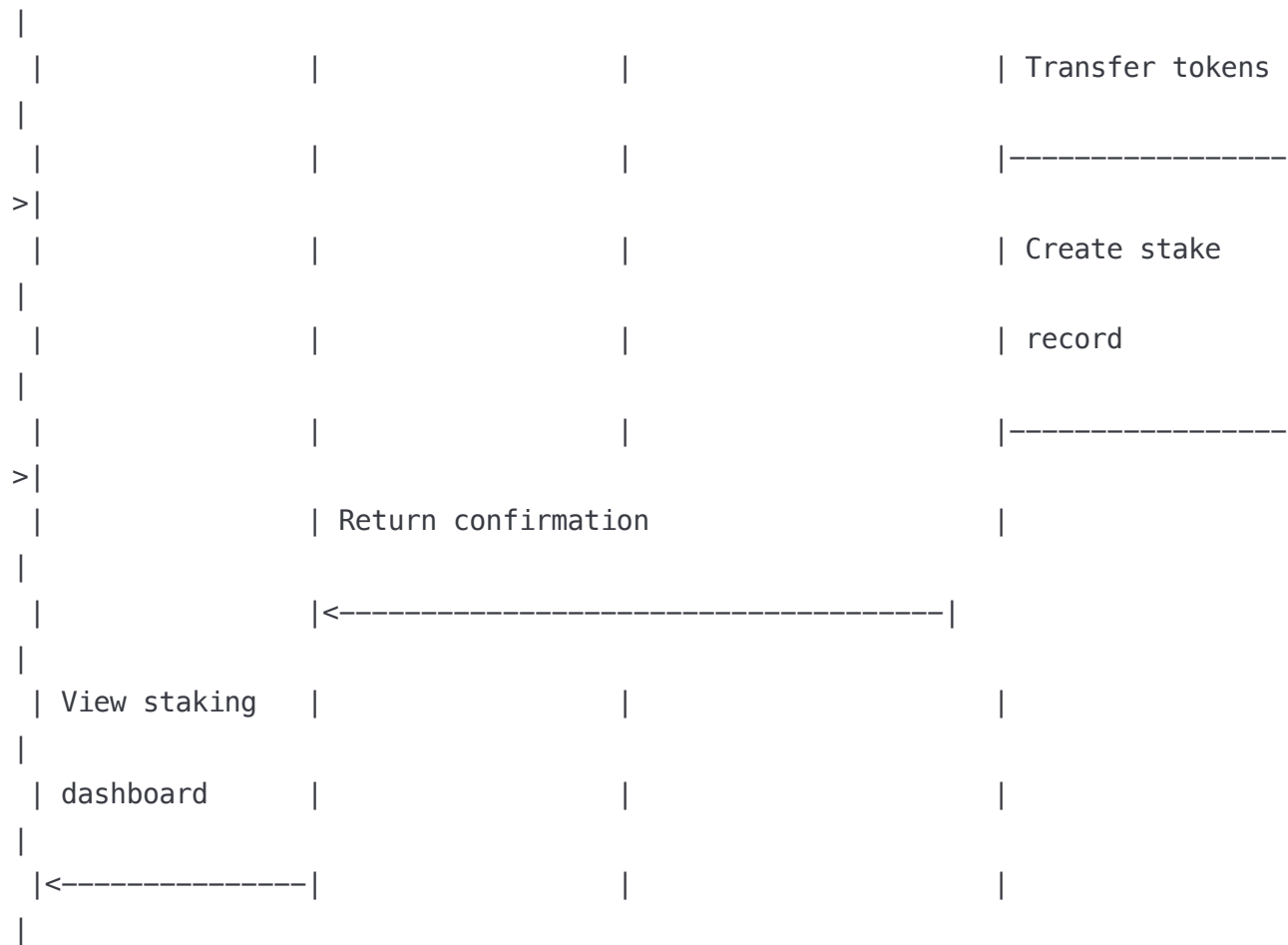
6.1 Content Contribution and Reward Sequence



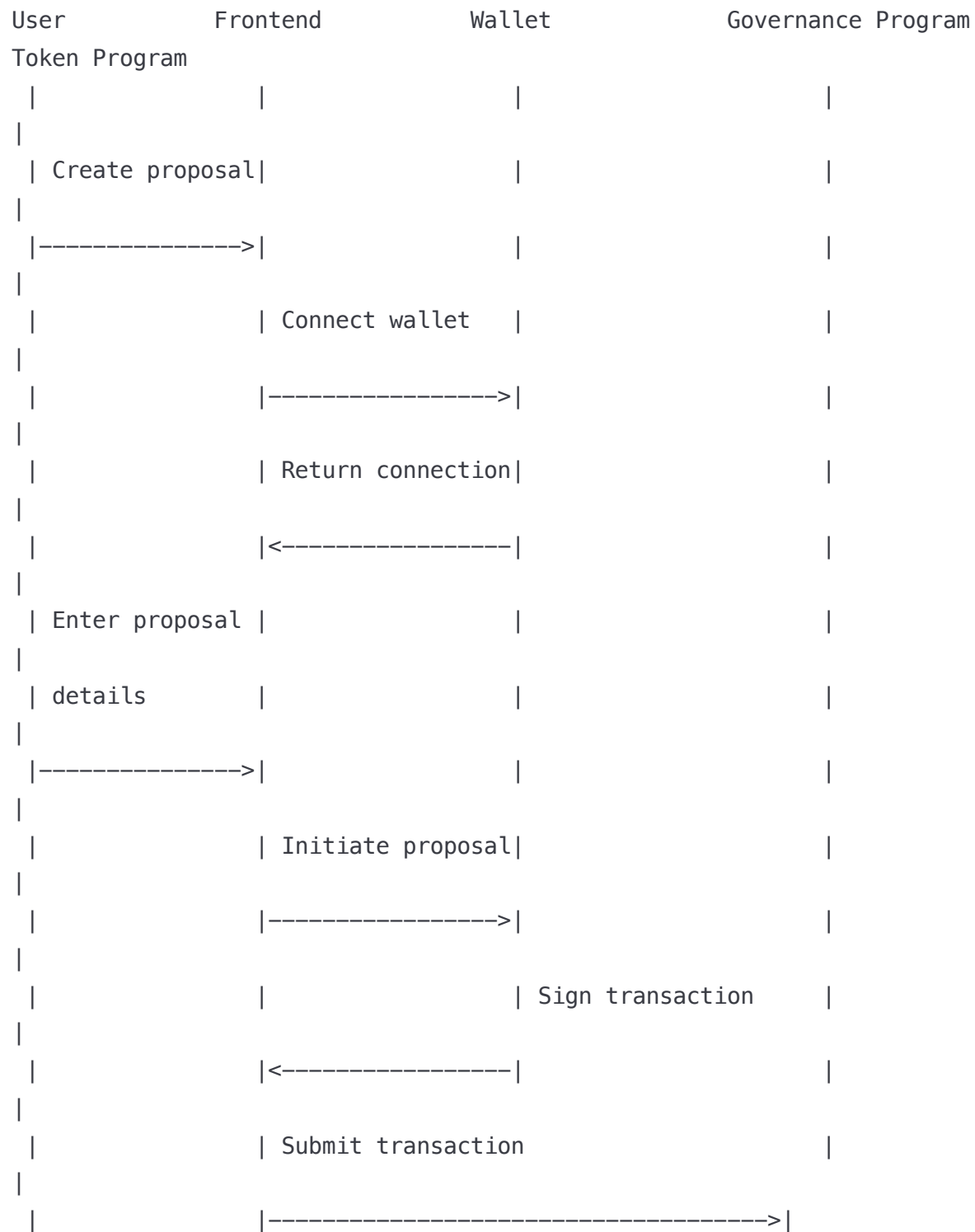


6.2 Token Staking Sequence





6.3 Governance Proposal Sequence





7. Risks and Mitigations

7.1 Technical Risks

- **Smart Contract Vulnerabilities:** Multiple audits, formal verification
- **Scalability Issues:** Performance testing, optimized batch operations
- **Integration Failures:** Comprehensive testing, fallback mechanisms

7.2 Economic Risks

- **Token Value Fluctuation:** Deflationary mechanisms, utility incentives
- **Gaming the System:** Anti-fraud detection, quality assessment algorithms
- **Low Participation:** Engagement incentives, minimum reward guarantees

7.3 Operational Risks

- **Execution Delays:** Automated monitoring, alert systems
- **Resource Constraints:** Cloud scaling, load balancing
- **Maintenance Challenges:** Documentation, knowledge sharing

8. Success Metrics

8.1 User Engagement

- Number of active contributors
- Contribution frequency
- Retention rate

8.2 Content Quality

- Average quality score
- Peer review participation
- Content demand mapping

8.3 Economic Health

- Token velocity
- Staking participation rate
- Governance proposal activity

9. Future Expansion

9.1 Additional Features

- Integration with additional wiki platforms
- Mobile application
- Advanced analytics dashboard

9.2 Ecosystem Growth

- Partner integrations
- Cross-platform interoperability
- Extended governance capabilities

9.3 Enhanced Tokenomics

- Dynamic reward algorithms
- Additional utility mechanisms
- Cross-chain compatibility

10. Conclusion

The Wiki Contribution Token system provides a comprehensive incentive mechanism for wiki contributions through tokenized rewards, engagement incentives, and community governance. By implementing this system in phases, the platform can build a sustainable ecosystem that rewards quality content creation while enabling community ownership through staking and governance.