Product Requirements Document (PRD)

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Project Title: Blockchain-Based Real Estate Co-Ownership Platform using ICP

Objective

To build a secure, transparent, and efficient platform that utilizes the Internet Computer Protocol (ICP) to tokenize real estate assets, allowing fractional ownership, seamless investment, and shared returns through blockchain smart contracts.

Target Users

- Retail investors seeking fractional ownership in real estate
- Property developers seeking diversified funding
- Asset management firms and REITs

Key Features

A. Property Tokenization

- Each property is represented as a Non-Fungible Token (NFT) or fungible tokens (FTs)
- Tokens represent fractional ownership (e.g., 1 token = 1
- Smart contracts manage ownership rights, dividend distribution, and resale conditions

B. Investment Dashboard

- Real-time display of portfolio
- Track property value, ownership percentage, and estimated returns
- Token balance and transaction history

C. Marketplace for Properties

- Browse available tokenized real estate
- Filter by location, property type, risk level, expected ROI
- Token purchase through integrated crypto wallet (e.g., ICP wallet)

D. Smart Contract Engine

- Built on ICP canisters
- Automates dividend payout, property appreciation handling, co-owner voting
- Integrates with third-party oracles for real estate data

E. Voting Governance

- Token-based voting for co-owners
- Approve or deny changes like property maintenance, sale, or lease agreements

F. Liquidity Exit

- Peer-to-peer resale market for property tokens
- Option for platform buyback or third-party buy-in

G. Compliance KYC

- Integrated KYC/AML verification
- Jurisdiction-specific compliance management

User Journey

1. **Sign Up / KYC**: User creates an account and passes KYC verification
2. **Browse Properties**: User explores tokenized properties listed on the platform
3. **Invest**: User buys property tokens using their wallet
4. **Monitor Portfolio**: Dashboard shows live performance and expected returns
5. **Vote**: Participate in governance decisions when required
6. **Receive Rewards**: Rental income and capital gains are distributed via smart contracts
7. **Exit**: Sell tokens on marketplace or hold for appreciation

Technical Stack

- **Blockchain**: Internet Computer Protocol (ICP)
- **Smart Contracts**: ICP Canisters written in **Rust**
- **Frontend**: React.js + Tailwind CSS
- **Authentication**: Internet Identity (II)
- **Backend API**: Rust-based service layer within ICP canisters
- **Database (Off-chain metadata)**: Motoko-based or PostgreSQL through off-chain bridge
- **Storage**: IPFS or ICP storage for property documents and legal contracts

Metrics for Success

- User acquisition retention rates
- Total volume of fractional real estate assets tokenized
- Number of successful co-ownerships initiated
- Smart contract uptime and transaction success rate
- Average return on investment for users

Future Enhancements

- Mobile application
- AI-based property recommendation engine
- Support for global currencies
- Interoperability with other blockchains (via bridges)
- Automated tax reporting

Advanced Features

- **Rental Income Automation**: Automate rent distribution via smart contracts and include an income calendar.
- **Voting for Governance (DAO style)**: Co-owner voting for decisions like property sale, maintenance, or reassignments.
- **Token Value Appreciation Tracking**: Live valuation updates through oracles; price updates reflect resale value.
- **Geolocation Legal Filter**: Filter properties based on legal feasibility and region.

- **Digital Agreement Signing (Blockchain Notary)**: On-chain e-signatures for property agreements.
- **AI-powered Property Recommendation Engine**: Recommend investments based on ROI, liquidity, and investor goals.
- **Mobile-Responsive PWA**: Access portfolios and investments from mobile devices.
- **Biometric/2FA Wallet Login**: Strengthen wallet access security with WebAuthn/OTP.

Bonus Ideas

- Green Real Estate Badge for eco-certified properties
- Co-Investor Chatrooms for community governance
- NFT-based Amenity Access for co-owners (e.g., gym access)