

# Requirements

## 1. Wallet & Network Management

- **Adapters:** Wagmi + ethers/viem with typed ABIs; Reown AppKit for unified modal.
- **Auto-Switch:** Prompt `wagmi.switchNetwork()` toast when on wrong chain; fallback to manual switch.
- **Reconnect:** Persist last used wallet in `localStorage` for one-click reconnect.

## 2. Smart-Contract Flexibility

- **Upgradeable Proxies:** On load, fetch proxy admin via `eth_getStorageAt`, retrieve current implementation's ABI dynamically.
- **Multi-Provider RPC:** Alchemy primary; public Infura/Fallback; round-robin fail-over on rate-limit errors.

## 3. Betting Core

- **Round Lifecycle:** Subscribe to `StartRound`, `LockRound`, `EndRound` events; fallback to 15 s polling only if subscription fails.
- **Oracle Integration:** Chainlink AggregatorV3; detect oracle staleness (>30 s no update) → show "Oracle stalled, please wait..." banner.
- **Edge Cases:**
  - **Canceled Epoch:** Display "Round void, refunding..." with automatic on-chain refund transaction.
  - **Contract Paused:** Show global pause screen with reason.

## 4. Responsible Gaming & Compliance

- **Daily Wager Cap:** Configurable cap per wallet; block bets exceeding limit.
- **Self-Exclusion:** Toggle in settings; zero betting ability when enabled.
- **Age-Gate & Geoblock:** Pre-connect check via IP-geolocation; block prohibited jurisdictions, require date-of-birth validation.

## 5. UX & Accessibility

- **Mobile-First, Responsive:** Tailwind tokens, clear breakpoints, fluid layouts, no hard-coded widths.
- **Performance Budgets (CI-Enforced):**
  - **Initial JS  $\leq 200$  kB, LCP  $\leq 2$  s, TBT  $\leq 300$  ms, FID  $\leq 100$  ms, CLS  $\leq 0.1$  on 4 G.**
- **Skeletons & Animations:** Framer Motion for card "flip," toasts, load transitions.
- **WCAG 2.1 AA:** ARIA labels, keyboard focus rings, color-contrast  $> 4.5:1$ , eslint-plugin-jsx-a11y rules.

## 6. Transactions & Feedback

- **State Machine:** Implement Pending  $\rightarrow$  Mining  $\rightarrow$  Confirmed  $\rightarrow$  Failed; on fails, allow retry; track tx hash history.
- **Fee Estimates:** `viem.estimateGas()` + on-chain fee-oracle  $\rightarrow$  display ETH & USD before confirm.
- **Links:** Direct Polygonscan links for each tx step.

## 7. Data & Performance

- **TheGraph Subgraph:** Query history and leaderboard; endpoint URL in env; paginated queries with caching (stale-while-revalidate).
- **Debounce & Throttle:** UI input debouncing; state refresh throttling to 1 s max.
- **Event Subscriptions:** Use `wagmi.watchContractEvent`; automatic reconnect on WS drop.

## 8. Testing & CI/CD

- **Unit:** Jest + React Testing Library; Stryker mutation testing (target  $\geq 90$  %).
- **E2E:** Playwright tests: connect  $\rightarrow$  bet Up/Down  $\rightarrow$  wait for result  $\rightarrow$  claim.
- **CI Pipeline:** GitHub Actions matrix (Node 18/20, Chrome/Firefox); Lighthouse-CI with thresholds above; fail on regressions.

- **Deployments:** Vercel/Netlify previews per PR; auto-comment URLs back to GitHub.

## 9. Internationalization & Monitoring

- **I18n:** `react-i18next` ; locales in `public/locales/{lang}.json` ; fallback chain: `en → en-US` .
- **Error Logging:** Sentry with stripped/obfuscated wallet addresses; capture boundary errors in React.