

GachaFi – Software Requirements Document (SRD)

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Prepared for: Development Team (Lovable.dev Squad)

Author: – Product Lead

1. Introduction & Objectives

GachaFi is a mobile-first Progressive Web Application (PWA) built on the RadixDLT blockchain. It gamifies decentralized finance (DeFi) interactions by turning TikTok-style short-form content into loot-box NFTs, called Capsules. Each swipe represents a DeFi interaction, and every share generates engagement-based rewards.

Primary Objective: Build the world's simplest "TikTok-to-DeFi" gacha game where every swipe opens loot, every share mints NFTs, and every interaction fits on a thumb.

2. System Overview & Architecture

The system consists of a frontend PWA interface, backend microservices, and blockchain interaction layer. The architecture is modular, ensuring separation between UI/UX, logic, and decentralized interactions.

Key Components:

- Frontend (React + Vite + TypeScript, PWA-compliant)
- Service Worker for offline functionality (IndexedDB caching)
- Radix DApp Toolkit for wallet connect and transaction handling
- Backend Analytics using PostHog
- Babylon Persona Connect for identity management
- WebSocket server for live leaderboards and challenge updates

3. Functional Requirements

The system will be developed in three major phases, each with specific functional deliverables and acceptance criteria:

Phase 1 – MVP “One-Swipe Gacha”

Goal: Achieve 60% Day-1 retention among 100 beta users.

Component	Requirement	Acceptance Criteria
Wallet	Integrate Babylon Persona connect with <2 taps, no seed phrase	Pass if connection <3s
Capsule Tier	Implement 3 tiers (8 / 15 / 25 XRD) selectable via swipe	Zero mis-swipes in 50 tests
Open Animation	CSS-based 600ms loot reveal animation	Plays offline
Share	Pre-filled TikTok share sheet	≥80% success rate
Error Handling	Auto-dismiss toast for insufficient balance	Appears within 1s
Analytics	PostHog event tracking for all actions	Complete funnel tracking

Phase 2 – “Swipe & Earn”

Goal: Reach \$1M USD cumulative revenue within 90 days.

Component	Requirement	Acceptance Criteria
Streaks	Implement 7-day swipe streak bonus	UI stable across all tests
Boosters	5 XRD swipe-up toggle booster	Works on iOS and Android
Creator Dashboard	Display SP royalties in real time	Visible without login
Push Notifications	Daily swipe reminders	≥25% open rate
Offline Queue	Cache opens and sync after reconnect	<5s sync time

Phase 3 – “Swipe & Conquer”

Goal: \$10M USD annualised revenue and 1B XRD TVL.

Component	Requirement	Acceptance Criteria
Guilds	Swipe-right to create/join guild	Join flow <5s
Flash Challenges	Timed 30-second swipe quests	Completion logged
Bridge Swipe	USDC→XRD via swipe-up	≥95% success rate
Live Leaderboard	WebSocket-powered auto-update every 5s	<1s latency
Dark Mode Toggle	Swipe-down gesture with haptics	State persisted offline

4. Non-Functional Requirements

- Performance: Offline reveal ≤600ms; reconnect sync <5s.
- Security: Wallet connect via Babylon Persona only; no seed storage.
- Scalability: Backend must handle ≥10k concurrent WebSocket connections.
- Accessibility: WCAG 2.1 AA compliance, 48px touch targets.
- Reliability: Offline mode mandatory for core gameplay.
- Availability: ≥99% uptime via CDN edge caching.

5. Data Schema

IndexedDB (client-side): stores capsule data, streaks, cached transactions.

Backend (PostHog + Firebase): logs analytics and leaderboard data.

RadixDLT: smart contract holds capsule tier logic, booster pools, and bridge swaps.

6. API & Blockchain Interfaces

- Babylon Persona API: for user connect and verification.
- Radix Engine methods: `mint_capsule()`, `open_capsule()`, `bridge_tokens()`.
- WebSocket channels: `/leaderboard`, `/flash-challenges`.
- Analytics API: `event_stream/connect`, `event_stream/share`.

7. Testing & Validation

Each phase must pass functional, UI/UX, and offline regression tests.

- Unit Tests: Components, blockchain calls, and offline sync.
- Integration Tests: Wallet connect, capsule opening, sharing flow.
- Performance Tests: Reveal speed, sync time, WebSocket latency.
- User Tests: 100 beta users; ≥60% retention required for MVP exit.

8. Future Expansion

Planned extensions:

- Cross-chain liquidity via Hyperlane.
- NFT Marketplace integration for Capsules.
- Social feed for creators and guilds.
- DAO governance module for community-driven events.