

Modular Scheduling & Reservation Application

Browser-Based | Cloud-Native | Solana-Integrated |
Dashboard-Embedded

I. Purpose

To build a **modular, browser-accessible application** for **universal scheduling and appointment management**, designed for seamless integration into **Per Diem's user and merchant dashboard**, supporting:

- **Cross-industry use:** hospitality, wellness, food service, retail, and events
 - **Tokenized commerce** via **Solana blockchain**
 - **NFT-based Proof-of-Experience (PoX)** receipts and loyalty artifacts
 - **Custom workflows and booking types** across diverse businesses
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II. Core Features

1. Universal Scheduling System

- Supports bookings by:
 - Time slot (hourly, daily)

- Service category
- Location and staff
- Dynamic slot management (buffers, no-show protection, overbooking rules)

2. Customizable Sector Templates

- Retail: appointment shopping, fitting room bookings
- Restaurants: table reservations, pre-order preferences
- Hospitality: check-in/out timing, spa or concierge services
- Beauty/Wellness: stylist assignment, repeat session tracking
- Clinics/Studios: intake forms, recurring appointments, staff rotation

3. User & Merchant Interface

- Embedded within **Per Diem's dashboard**
- Role-based dashboards (admin, staff, guest)
- Responsive mobile-first design

4. Reminders & Calendar Sync

- SMS/email notifications
- Google, Apple, Outlook calendar integration

- Smart reminder sequencing based on booking type and token tier
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III. Solana Blockchain Integration (Native Only)

All blockchain features are **exclusive to the Solana network** using Solana-native tooling and standards:

A. Tokenized Booking Engine

- Accepts **\$PER and vertical SPL tokens** (\$LODGE, \$DINING, \$GRUB, etc.)
- Smart contract-based deposits to reduce no-shows
- Instant booking confirmation upon successful token payment

B. PoX (Proof-of-Experience) NFTs

- Auto-minted **compressed NFTs** using Metaplex Bubblegum
- Metadata includes location, timestamp, service, and staff
- NFTs can unlock future perks, track loyalty, or serve as digital souvenirs

C. Tiered Rewards System

- Loyalty milestones tracked via NFTs or token spend
- Higher tiers unlock early reservations, upgrades, or exclusive access

- DAO-voted features allow community-led evolution of reward logic
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IV. 🧩 Application Architecture

Layer	Description
Frontend	React + Tailwind UI, modular layout system
Backend	Node.js with GraphQL/REST APIs, PostgreSQL for bookings
Blockchain	Solana smart contracts via Anchor framework
NFT Engine	Metaplex + Helius API for minting, indexing
Wallet Support	Phantom, Solflare, Backpack (Solana-compatible)
Cloud Infra	AWS or GCP with CI/CD deployment, Redis caching for speed

V. ⚙️ Integration & Extensibility

- **POS Wrappers:** For Square, Toast, Lightspeed, etc.
- **Marketplace Modules:** Enable users to browse bookable services via Per Diem marketplace

- **API Layer:** External vendors can integrate via secure endpoints
 - **SDKs:** Available for merchants to embed booking UI on their websites
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VI. **AI & Smart Features (Optional Enhancements)**

- Demand-based slot pricing (token-based incentives for low-demand times)
 - Smart booking suggestions based on past behavior and token tier
 - Auto-matching to preferred staff or previous venue
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VII. **Security & Compliance**

- End-to-end encryption of booking and identity data
 - Wallet-based auth with backup email/2FA
 - GDPR/CCPA-ready data architecture
 - Solana smart contract audits and fail-safe transaction logic
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VIII. **Analytics & Insights**

- Booking conversion by token type

- NFT issuance and claim rates
 - Loyalty progression by wallet address
 - Heatmaps of service utilization
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IX. Implementation Roadmap

Phase	Milestone
1. Discovery & MVP	Base scheduling + token booking (\$DINING, \$LODGE)
2. NFT Integration	PoX minting, NFT viewer in wallet
3. Sector Expansion	Retail, beauty, wellness modules
4. DAO Features	Tiered access rules + governance voting
5. Mobile Extension	Responsive wallet integration, real-time booking

X. Deliverables

- Fully integrated **Per Diem dashboard module**
- Booking & calendar widget for merchants
- Solana-native smart contracts (Anchor)

- PoX NFT minting templates
 - API & SDK documentation
 - Admin portal for configuration
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XI. 🧬 Alignment with Per Diem's Vision

Experience Layer Solana-Based Benefit

Poetic commerce NFTs preserve memory of each interaction

Seamless utility SPL tokens provide cross-category redemption

Loyalty gamification NFT + token logic governs user tier & perks

Creator economy Service providers mint branded experience NFTs

Would you like this plan prepared as a:

- Developer specification?
- Partner onboarding pitch?
- Product brief for internal roadmap?

Let me know how you'd like it framed next.