# Inventory Management Plan

*Cloud-Native | Browser-Based | Blockchain-Optimized | Sector-Adaptive | Solana-Integrated*

## I. Purpose

To deliver a robust, browser-based, cloud-hosted inventory management system embedded in the **Per Diem dashboard**, purpose-built to unify inventory, cost control, recipe tracking, and multi-venue visibility across industries:

- **Retail**

- **Food & Beverage**

- **Hospitality**

- **Health & Beauty**

- **Event & Mobile Vendors**

This system provides **real-time inventory lifecycle tracking**, **recipe and batch-level traceability**, **automated procurement**, and **Solana-native blockchain integration** for tokenized payments, PoX-based inventory NFTs, and supply chain incentives.

## II.  Core Capabilities

**1. Item Master & SKU Control**

- Item types: Raw, prepared, batch, virtual/combo, service-linked

- SKU-level attributes: Unit type, location assignment, cost, tags, expiration rules

- Multi-location sync: Auto-update across venue clusters or regional zones

- Dynamic bundling: Track group SKUs (e.g., "Room Package A", "Combo Meal #5")

## 2. Recipe & Batch Tracking

- Create multi-level recipes with ingredient deduction per portion

- Define prep yields, cooking shrinkage, spoilage ratios

- Track batch production (e.g., sauces, infusions, spa blends) with lot IDs

- Recipe cost breakdown (live sync to ingredient market prices)

## 3. Real-Time Inventory Ledger

- FIFO and batch-aware tracking

- Live updates from POS transactions and bookings

- Manual adjustments: waste, breakage, transfers, donations

- On-hand vs. theoretical stock delta alerts

## 4. Procurement & Reordering

- Create and manage purchase orders (POs) manually or by rule

- Set par levels, reorder thresholds, and min/max inventory bands

- Auto-suggest reorder quantities based on usage velocity and events

- Approval flows: multi-role POs with vendor and manager permissions

# III.  Sector-Specific Adaptations

| Sector | Inventory Control Features |
|---|---|
| Retail | Barcode sync, variant matrix, seasonality tagging |
| Food Service | Recipe deduction, prep batch tracking, allergen flags |
| Hospitality | Room amenity packs, daily linen turnover, minibar restock |
| Health/Beauty | Per-service consumable deduction, sterilization logs, product expiry |

# IV. Solana Blockchain Integration (Modular, Optional)

**A. Token-Based Procurement**

- Solana-native payments to suppliers using $PER, $GRUB, $LODGE, etc.

- SPL token settlement via Anchor smart contracts

- Token-based discounts or loyalty perks for verified vendors

**B. NFT Inventory Tags**

- Mint NFTs tied to:

  - Limited-run products (e.g., special vintage wine)

  - Guest-generated keepsake purchases

  - Batch-limited items for event exclusivity

- Metadata: vendor, date, lot, batch, redemption logic

**C. Proof-of-Excellence (PoX) Inventory**

- Link inventory (e.g., a curated tasting plate or spa blend) to NFT mints

- Inventory-triggered NFTs used in PoX quests, badge rewards, or memory keepsakes

# V.  System Architecture

| Layer | Tech |
| --- | --- |
| **Frontend** | React.js + Tailwind; modular, responsive interface |
| **Backend** | Node.js with PostgreSQL and Redis caching |
| **Blockchain Layer** | Solana smart contracts via Anchor; Metaplex + Helius for NFTs |
| **API Interfaces** | GraphQL/REST for 3rd-party POS, vendors, delivery systems |
| **Infra** | AWS/GCP, multi-region replication, Cloudflare CDN |

# VI.  Integrations & Extensibility

- **POS Sync**: Square, Toast, Clover, Shopify, Lightspeed
- **Booking Systems**: Deduct inventory for scheduled services or bookings
- **Vendor Portals**: Allow vendors to update stock status, confirm orders, upload certifications
- **Signage Sync**: Link low-stock or featured items to public displays

- **Webhook Support**: Inventory event hooks for alert systems, fulfillment, or smart kitchen devices

## VII. Controls & Compliance

- **Role-Based Access (RBAC)**: Inventory roles (manager, staff, viewer, accountant)

- **Audit Trails**: Full transaction history—stock adds, usage, wastage, NFTs

- **GDPR/CCPA-Ready**: Supply chain data masking, access logs, PoX anonymity safeguards

- **Blockchain Transparency**: Token flows and NFT events logged on Solana

## VIII. Analytics Suite

- **Cost of Goods Sold (COGS)** per recipe, venue, vendor

- **Wastage Reports**: Item, value, staff ID, notes

- **Stock Accuracy**: Actual vs. expected tracking

- **Token Impact**: Token redemptions vs inventory movement

- **Vendor Performance**: Timeliness, fulfillment rate, item quality score

## IX. 💡 Smart Features (Optional)

- **Predictive Ordering**: Based on trends, PoX events, weather, or local holidays

- **AI Shelf Life Extension Suggestions**: Promotions or flash discounts

- **Token-Based Gamification**: Inventory team earns NFTs or token rewards for accuracy, waste reduction

- **Recipe Margin Optimizer**: Highlights most profitable dishes or services

# X.  Roadmap Phases

| Phase | Deliverables |
| --- | --- |
| **1. Core MVP** | Inventory CRUD, real-time ledger, multi-location sync |
| **2. Recipe Engine** | Deduction logic, COGS tracking, batch support |
| **3. Vendor & PO System** | Rule-based POs, approval workflows, token payment |
| **4. Blockchain Tools** | NFT-linked inventory, tokenized purchasing, PoX minting |
| **5. AI Optimization Layer** | Forecasting, auto-promos, smart alerts, gamified compliance |

# XI. Final Deliverables

- Modular Inventory Dashboard integrated in Per Diem merchant suite

- POS & booking sync interfaces

- Vendor order engine with Solana payment support

- Recipe and batch control system

- NFT minting engine for tagged inventory

- Analytics & reports portal

- Admin panel for multi-location inventory governance

# XII. 🧬 Per Diem Ecosystem Alignment

| Pillar | Contribution |
| --- | --- |
| Proof-of-Experience | Inventory becomes mintable PoX artifacts |
| Token Utility | $PER, $GRUB, $MERCH etc. used in actual vendor/supplier orders |
| Sustainability | Wastage reduction via tracking + token incentive |
| Experience Commerce | Inventory that powers travel, dining, lodging moments—recorded via NFTs |

Here is a new section added to the Inventory Management Plan, focusing on **gamifying internal inventory controls** to incentivize staff accuracy, reduce waste, and encourage operational excellence. This module uses **Solana-based tokens** and **Proof-of-Excellence NFTs** as on-chain rewards tied to individual or team performance.

## XIII. 🕹️ Gamified Inventory Control Incentives

**Objective:**

To introduce a **performance-based reward system** that engages employees in active, measurable inventory stewardship. By tracking metrics such as stock accuracy, waste reduction, and recipe adherence, staff can earn **Solana-based tokens ($PER, $GRUB, $MERCH)** and collectible **Proof-of-Excellence NFTs** for verifiable achievements.

**Core Mechanics:**

- Metrics are measured daily, weekly, or monthly based on predefined thresholds

- Rewards are automatically triggered through smart contract logic on Solana

- NFTs serve as digital merit badges, redeemable for perks or displayed in PoX wallets

- Merchant admins configure reward criteria per venue or department

## Tracked Performance Metrics

- **Inventory Accuracy**: Actual vs theoretical variance within accepted margin (e.g., ±2%)

- **Wastage Control**: Below average spoilage/loss compared to previous periods

- **Recipe Precision**: Correct deduction ratios, batch yields, or ingredient usage

- **Order Timing**: Completing reorder/restock flows proactively (before alerts trigger)

## Sample Reward Tiers & Incentive Plans

| Plan Name | Criteria | Reward Type | Frequency |
|---|---|---|---|
| **1. Gold Ledger Award** | 30 consecutive days with <1% inventory discrepancy | **Proof-of-Excellence NFT** + 50 $PER | Monthly |
| **2. Waste Warrior Bonus** | Reduce category waste by 20% compared to prior month | 100 $GRUB + digital badge NFT | Monthly |
| **3. Recipe Ace Challenge** | 100% deduction accuracy for all | 25 $MERCH + skip-the-line staff perk | Weekly |

| Plan Name | Criteria | Reward Type | Frequency |
|---|---|---|---|
| | prepared recipes in a week | | |
| **4. Stock Hero Contest** | Fastest reorder accuracy and fulfillment logging across team | Custom NFT + $LODGE voucher for partnered lodging | Quarterly |

## Integration & Automation

- Staff users log actions through the Per Diem dashboard (or via mobile module)

- Performance tracking engine runs in real-time, matched to inventory logs

- Token disbursement handled via Solana smart contracts (gas fees abstracted from users)

- NFTs minted via Metaplex + Helius and linked to employee wallet

## Oponal Redemption Perks (Customizable by Merchant)

- Early access to tips or staff perks

- Meal/stay credits for on-site lodging or services

- Limited-time NFTs exchangeable for bonus tokens

- Internal leaderboard rankings with PoX NFT trophies

# XIV. Summary

The Per Diem Inventory Management Module is a **sector-adaptable**, **cloud-native**, and **Solana-integrated** platform designed to modernize and unify inventory operations across retail, food service, hospitality, wellness, and event-based environments. Embedded directly within the Per Diem dashboard, this system combines robust item tracking, real-time stock synchronization, recipe-based deductions, smart procurement, and vendor coordination into one seamless interface.

By leveraging **Solana blockchain technology**, the platform enables **tokenized procurement**, **inventory-linked NFTs**, and **on-chain incentives**, allowing both vendors and employees to engage in a transparent, reward-driven supply system. Its integration with existing POS systems and booking tools ensures minimal friction and rapid adoption across all operational layers.

The inclusion of **gamified inventory incentives** encourages employee engagement and operational accountability. Team members can earn tokens and Proof-of-Excellence NFTs for achieving high performance in areas such as waste reduction, stock accuracy, and recipe precision—driving better behavior through positive reinforcement.

Backed by real-time analytics, AI-driven forecasting, and blockchain-secured audit trails, the Inventory Control Plan ensures merchants stay ahead of demand, minimize losses, and transform everyday operations into opportunities for engagement, loyalty, and revenue.

Together, this system does more than manage stock—it **redefines inventory as an experiential and economic layer** in the Per Diem ecosystem, where each item, order, and interaction is tracked, optimized, and celebrated.

*From Stock to Story — Inventory That Works, Rewards, and Remembers.  This is Per Diem.*