

# SyncServe POS – Full Detailed Product Requirements Document (PRD)

Version 1.0 | Date: 2026-01-24 | Scope: Restaurant, Café, Food Zone/Food Court, Cloud Kitchen | Multi-country + Offline POS + AI/ML Ready

## 1. Executive Summary

SyncServe POS is a production-grade, multi-tenant Point of Sale and Operations Management platform designed for food service businesses. It supports multi-outlet operations, table service workflows, kitchen operations (KDS/KOT), inventory and purchasing, reporting, and strict auditability. The platform must be multi-country accessible with a configurable tax engine (GST/VAT/Sales Tax) and must support offline POS operation with safe synchronization. AI/ML capabilities are included in phased delivery, starting with AI-ready event logging and progressing to forecasting, smart replenishment, and anomaly detection.

## 2. Goals and Success Metrics

### 2.1 Product Goals

- Fast and reliable POS billing under peak load with minimal steps.
- Centralized control of multi-outlet businesses and standardized operations.
- Operational transparency via shift management, audit logs, and role-based approvals.
- Reduced stock-outs and wastage through inventory discipline and AI-assisted planning (Phase 2+).
- Multi-country compliance via configurable tax, currency, timezone, and invoice settings.
- Offline-first reliability with queue-based sync and conflict handling.

### 2.2 KPIs

- POS order-to-payment completion time: < 30 seconds typical flow.
- POS-to-KDS order propagation: < 2 seconds online.
- System uptime target: 99.5%+.
- Shift closing cash variance incidents reduced month-over-month.
- Inventory variance reduction: 10–25% (after inventory discipline + AI).
- Forecast accuracy (Phase 2): 70–85% initial target by category/outlet.

## 3. Personas and Roles

Persona	Primary Needs	Key Screens/Modules
Owner	Multi-outlet visibility, controls, profitability insights	Dashboard, Reports, Pricing, Users/Roles, AI Insights
Outlet Manager	Approvals, operations control, shift closing, exceptions	Shift, Audit Logs, Orders, Inventory, Reservations
Cashier	Fast billing, payments, receipts, minimal errors	POS Billing, Payments, Shift Open/Close
Waiter/Server	Table handling, quick ordering, transfers/merge/split	Table Map, Order Entry
Kitchen Staff	Clear queue, prep status, station routing	KDS, KOT Printing
Inventory Manager	Stock control, GRN, adjustments, low stock	Inventory, Purchase, Stock Movements

Accountant	Tax reports, exports, settlements	Tax Reports, Sales Exports, Shift Reports
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## 4. Scope

### 4.1 In Scope (Phase 1 – MVP)

- Multi-tenant admin portal + outlet/terminal setup.
- Menu management (items, categories, variants, modifiers).
- POS billing (dine-in/takeaway/delivery), discounts, split payments.
- Table & floor management (restaurant mode).
- KOT printing + KDS basic workflow.
- Shift management (opening cash, closing cash, variance report).
- Inventory (stock in/out, adjustments) + purchasing (supplier, PO, GRN basic).
- Reporting (sales, tax, discounts, refunds, cashier performance).
- Audit logs (core coverage).
- Offline POS with sync queue and conflict-safe reconciliation.

### 4.2 Out of Scope (Phase 2+ candidates)

- Aggregator integrations (Swiggy/Zomato/UberEats/Talabat).
- Advanced loyalty campaigns and marketing automation.
- Full accounting ledger system (exports supported).
- Rider mobile app (dispatcher console can be Phase 2).
- Advanced AI modules beyond AI-ready logging (Phase 2/3).

## 5. Globalization: Multi-Country Support

### 5.1 Tenant-Level Settings

- Country, currency, timezone, locale.
- Tax model selection: GST / VAT / Sales Tax / No Tax.
- Invoice numbering series per outlet.
- Receipt templates per outlet (branding, footer policies).

### 5.2 Tax Engine Requirements

- Inclusive or exclusive tax pricing.
- Multiple tax slabs and tax groups.
- Item-level tax mapping with overrides per outlet if required.
- Tax summary per invoice and exportable tax reports.
- Service charge configuration (optional) with tax implications.

## 6. Offline POS Requirements (Critical)

## **6.1 Offline Capabilities**

- Create orders, apply permitted discounts, accept cash payments offline.
- Print receipts and kitchen tickets offline.
- Persist offline orders locally with a durable queue.
- Auto-sync when connectivity returns; preserve original timestamps.

## **6.2 Offline Sync Rules**

- Idempotent sync to prevent duplicate orders.
- Local order IDs mapped to server order IDs after sync.
- Conflict handling: menu/price updates vs local cached values.
- Sync retry with exponential backoff and failure visibility in UI.

# **7. Core Modules and Requirements**

## **7.1 Authentication & RBAC**

- Username/password login with optional PIN login for cashier.
- Granular permissions: view/create/edit/delete/approve/refund/void/discount override.
- Role scopes: tenant-level, outlet-level, terminal-level.
- Session management and login attempt rate limiting.

## **7.2 POS Billing (Dine-in/Takeaway/Delivery)**

- Fast item search, category browsing, barcode scanning support.
- Variants, modifiers, kitchen notes, customer notes.
- Discounts (item/order) with approval workflow and mandatory reason where required.
- Split payments and multi-tender support.
- Refunds/voids with role-based approval and mandatory reason.
- Receipt printing (thermal) + optional A4 invoice.

## **7.3 Table & Floor Management + QR Ordering + Reservations**

Table module must support floors/tables, statuses, waiter assignment, merge/split/transfer, QR code per table for customer scan ordering, and reservation management with conflict prevention.

- Floor creation and table creation with capacity and activation flags.
- Table statuses: Vacant, Reserved, Occupied, In Progress, Billing Pending, Cleaning, Blocked.
- Waiter assignment per table with reassignment logs.
- Merge tables into a billing group; split table/bill by items or amount.
- Transfer active orders between tables with strict validation.
- QR code per table: secure token, outlet/table mapping, customer web ordering flow.
- Reservation module: create/confirm/seat/cancel/no-show, calendar view, time-slot rules.

## **7.4 Kitchen Operations (KOT + KDS)**

- KOT printing on order confirmation; reprint requires permission.
- KDS receives orders in real-time; stations supported (kitchen/bar/dessert/packing) as configuration.
- Kitchen statuses: Accepted → Preparing → Ready.
- Prep-time tracking and SLA reporting (Phase 2: prediction).

## **7.5 Shift Management (Open/Close + Variance Report)**

- Shift scope configurable: terminal-based, outlet-based, or cashier-based.
- Shift open requires opening cash; optional denomination entry.
- During shift track: cash in/out, cash drops, no-sale drawer opens, refunds/voids.
- Shift close requires counted cash; compute expected cash and variance.
- Variance thresholds and manager approval workflow.
- Generate Z-report: sales, tax, payments, refunds, drawer movements, variance summary.

## **7.6 Inventory + Purchasing**

- Inventory items with units, low stock thresholds, outlet stock levels.
- Stock in/out, adjustments (wastage/damage/theft) with reason and audit.
- Supplier management, purchase orders, GRN receiving, purchase returns (optional).

## **7.7 Reporting & Analytics**

- Sales summary by date/outlet/terminal/cashier.
- Tax reports by slab/group and export.
- Discounts/refunds/voids report.
- Item/category performance and peak hour sales.
- Shift closing reports and cash reconciliation history.

## **8. Audit Logs (Compliance-Grade)**

Audit logs must be centralized, append-only, and queryable. Capture who did what, when, where, and what changed (before/after).

- Log authentication events, POS order changes, discounts, refunds, price overrides, receipt reprints.
- Log shift open/close and cash drawer events (cash in/out/drop/no-sale).
- Log inventory adjustments and purchasing approvals.
- Admin settings changes: taxes, menu pricing, outlet settings, permissions.
- Audit log UI: filters by date, outlet, user, module, action, severity; export CSV/PDF.

## **9. AI/ML Implementation (Phased)**

### **9.1 Phase 1 – AI-Ready Foundation**

- Event logging schema designed for ML training: orders, kitchen timestamps, inventory movements, shift data.

- Rule-based insights dashboard (smart alerts without ML).

## **9.2 Phase 2 – ML Modules**

- Demand forecasting by item/category/outlet with confidence score.
- Smart replenishment recommendations based on lead time and safety stock.
- Wastage and variance anomaly detection (inventory leakage).
- Fraud/anomaly detection: unusual refunds/discounts/voids by cashier.
- Upsell/cross-sell suggestions in POS (frequently bought together).

## **10. Non-Functional Requirements**

- Performance: POS UI <300ms typical; KDS update <2s online.
- Reliability: 99.5% uptime; safe retries and graceful degradation.
- Security: TLS, hashed passwords, RBAC, OWASP protections, audit trails.
- Scalability: multi-tenant; support multi-outlet growth and peak loads.
- Backup/DR: daily backups; defined RTO/RPO targets.

## **11. Acceptance Criteria (Go-Live Checklist)**

- POS billing stable under load; printing reliable.
- Offline billing works and sync is idempotent with no duplicates.
- Shift closing matches transaction totals and variance workflow works.
- Table management + QR ordering flows validated end-to-end.
- Inventory movements and purchasing update stock correctly.
- Reports match transactional truth; exports work.
- Audit logs cover all critical actions and are immutable.

## **12. Deliverables for Development Vendor**

- Final confirmed PRD/SRS, UI/UX designs, ERD/database schema.
- API documentation (Swagger/Postman) and integration guides.
- POS app, Admin portal, KDS module, QR ordering web app.
- Automated tests + load testing report + UAT support.
- Deployment pipeline, monitoring, backup strategy, and documentation.