Enhanced Multi-Unit Procurement System - Complete Overview

System Architecture Overview

Business Context:

- **Hotel Group**: 8 distinct hotel units
- **Multi-tenant system**: Each unit operates semi-independently
- **Centralized procurement**: Group-level oversight with unit-level operations
- **Supplier network**: Multiple suppliers serving different units/products
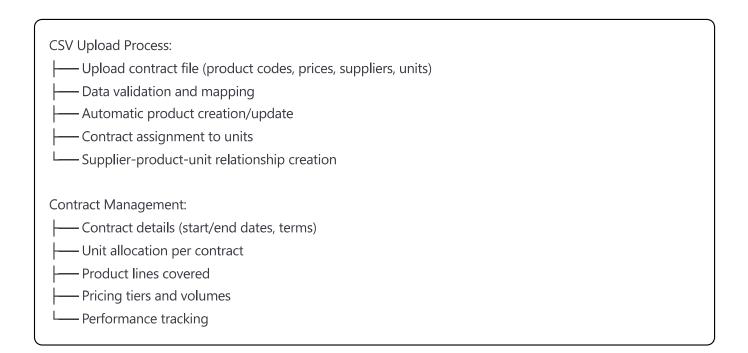

Expanded System Modules

Module 1: Enhanced Product & Contract Management 📦

(Original: Product Catalog)

New Features:

- **CSV Import System**: Bulk upload contract data from supplier agreements
- **Contract Management**: Track supplier contracts per unit
- **Multi-unit Product Allocation**: Same product, different suppliers per unit
- **Pricing Matrix**: Unit-specific pricing based on contracts

Functionality:

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CSV Upload Process:
├── Upload contract file (product codes, prices, suppliers, units)
├── Data validation and mapping
├── Automatic product creation/update
├── Contract assignment to units
└── Supplier-product-unit relationship creation

Contract Management:
├── Contract details (start/end dates, terms)
├── Unit allocation per contract
├── Product lines covered
├── Pricing tiers and volumes
└── Performance tracking
```

Module 2: Supplier Management & Portal 🏢

(New Module)

Admin Supplier Management:

- **Supplier Registry**: Complete supplier database

- **Unit Allocation**: Assign suppliers to specific hotel units

- **Contract Mapping**: Link suppliers to product categories/units

- **Performance Monitoring**: Delivery times, quality metrics

- **Contact Management**: Multiple contacts per supplier

Supplier Portal (External Access):

- **Dedicated supplier login**: Separate authentication system

- **Stock Level Monitoring**: Real-time view of their products across units

- **Low Stock Alerts**: Proactive notifications for restocking

- **Order History**: Track deliveries and performance

- **Unit-specific Views**: See only units they supply

```
Supplier Portal Features:
├── Dashboard: Stock levels across assigned units
├── Alerts: Low stock notifications for their products
├── Orders: View POs and delivery schedules
├── Analytics: Performance metrics and trends
├── Communication: Message system with procurement team
└── Documents: Access to contracts and specifications
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Module 3: Multi-Level Operations Management 📋

(Enhanced: Requisitions + Stock Management)

Role-Based Access Control:

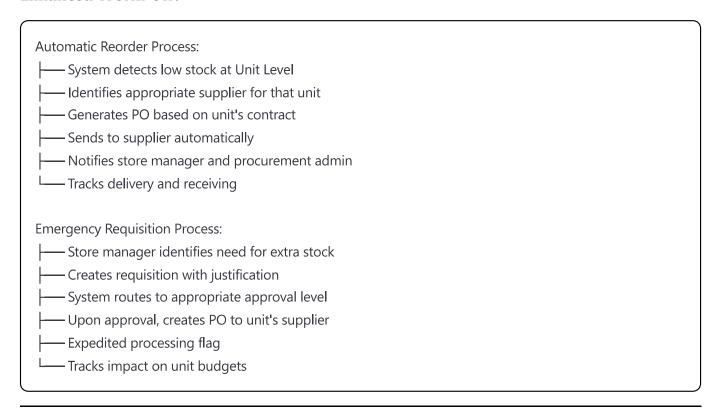**Procurement Admins (Group Level):**

- **Group Dashboard**: Overview of all 8 units

- **Contract Management**: Negotiate and manage supplier contracts

- **System Administration**: User management, system settings

- **Cross-unit Analytics**: Compare performance across units

- **Approval Authority**: High-value requisitions

Store Managers (Unit Level):

- **Unit Dashboard**: Focus on their specific hotel

- **Stock Receiving**: Process deliveries and update inventory

- **Emergency Requisitions**: Request additional stock beyond normal levels

- **Daily Operations**: Issue stock to departments

- **Unit Reporting**: Generate unit-specific reports

Enhanced Workflow:

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Automatic Reorder Process:
├── System detects low stock at Unit Level
├── Identifies appropriate supplier for that unit
├── Generates PO based on unit's contract
├── Sends to supplier automatically
├── Notifies store manager and procurement admin
└── Tracks delivery and receiving

Emergency Requisition Process:
├── Store manager identifies need for extra stock
├── Creates requisition with justification
├── System routes to appropriate approval level
├── Upon approval, creates PO to unit's supplier
├── Expedited processing flag
└── Tracks impact on unit budgets
```

Module 4: Advanced Batch & Tracking Management 📊

(New Enhancement)

Batch/Lot Tracking:

- **Batch Registration**: Track batches from receiving to consumption

- **Expiry Management**: Monitor expiration dates and FIFO rotation

- **Traceability**: Full audit trail from supplier to end use

- **Quality Control**: Track quality issues by batch

- **Recall Management**: Quick identification and isolation

Contract-Supplier Performance:

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Performance Tracking:
├── Delivery Performance: On-time delivery rates
├── Quality Metrics: Defect rates, returns
├── Cost Analysis: Price competitiveness
├── Service Level: Response times, communication
├── Unit Satisfaction: Store manager feedback ratings
└── Contract Compliance: Terms adherence
```

Module 5: Multi-Level Dashboard & Analytics 📈

(Enhanced: Reports + New Dashboards)

Group-Level Executive Dashboard:

- **Group Overview**: All units at a glance

- **Financial Metrics**: Total spend, savings, budget variance

- **Operational KPIs**: Stock levels, turnover rates, efficiency

- **Supplier Performance**: Group-wide supplier scorecards

- **Trend Analysis**: Historical patterns and forecasting

Unit-Level Operations Dashboard:

- **Unit Performance**: Specific hotel metrics

- **Stock Status**: Current levels, pending orders

- **Cost Analysis**: Unit spending vs budget

- **Supplier Performance**: Unit-specific supplier ratings

- **Operational Efficiency**: Local KPIs and trends

Advanced Analytics:

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Consumption Analytics:
├── Usage patterns by unit/season/event
├── Waste reduction tracking
├── Cost per occupied room
├── Inventory turnover optimization
└── Demand forecasting

Savings Analytics:
├── Contract negotiation savings
├── Bulk purchasing benefits
├── Waste reduction impact
├── Efficiency improvements
└── ROI on procurement initiatives
```

Module 6: Visualization & Reporting 📊

(Enhanced: PowerBI Integration or Custom)

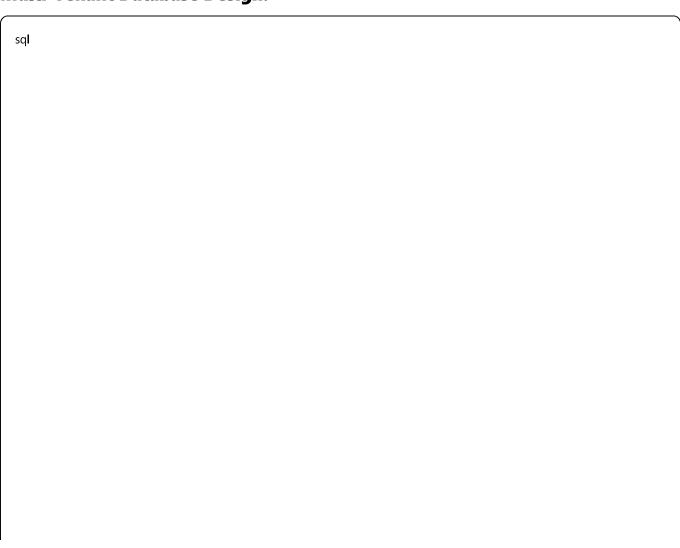**PowerBI Integration Option:**

- **Data Export**: Automated data feeds to PowerBI

- **Pre-built Dashboards**: Procurement-specific templates

- **Custom Reports**: Flexible analysis capabilities

- **Mobile Access**: PowerBI mobile app integration

Custom Visualization Alternative:

- **Interactive Charts**: Built-in using Chart.js/D3.js

- **Real-time Dashboards**: Live updating displays

- **Responsive Design**: Works on all devices

- **Export Capabilities**: PDF, Excel, CSV outputs
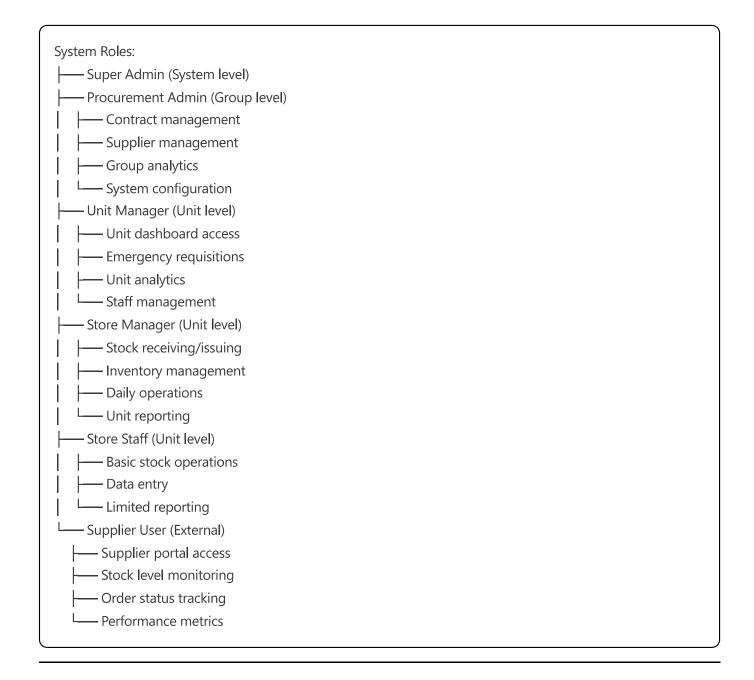

Technical Architecture Changes

Multi-Tenant Database Design:

```sql
```

```sql
-- Units table (8 hotel units)
CREATE TABLE units (
    id UUID PRIMARY KEY,
    unit_code VARCHAR(10) UNIQUE,
    unit_name VARCHAR(100),
    location VARCHAR(200),
    manager_contact JSONB,
    budget_settings JSONB
);

-- Enhanced supplier table
CREATE TABLE suppliers (
    id UUID PRIMARY KEY,
    supplier_code VARCHAR(50),
    company_name VARCHAR(200),
    contact_details JSONB,
    performance_metrics JSONB,
    portal_access_enabled BOOLEAN DEFAULT TRUE
);

-- Unit-Supplier-Product relationships
CREATE TABLE unit_supplier_products (
    id UUID PRIMARY KEY,
    unit_id UUID REFERENCES units(id),
    supplier_id UUID REFERENCES suppliers(id),
    product_id UUID REFERENCES products(id),
    contract_id UUID REFERENCES contracts(id),
    is_primary_supplier BOOLEAN DEFAULT FALSE,
    priority_order INTEGER
);

-- Batch tracking
CREATE TABLE batches (
```

```sql
    id UUID PRIMARY KEY,
    batch_number VARCHAR(100),
    product_id UUID REFERENCES products(id),
    unit_id UUID REFERENCES units(id),
    supplier_id UUID REFERENCES suppliers(id),
    received_date TIMESTAMP,
    expiry_date TIMESTAMP,
    quantity_received INTEGER,
    quantity_remaining INTEGER,
    status VARCHAR(20)
);

-- Enhanced stock movements with batch tracking
CREATE TABLE stock_movements (
    id UUID PRIMARY KEY,
    unit_id UUID REFERENCES units(id),
    product_id UUID REFERENCES products(id),
    batch_id UUID REFERENCES batches(id),
    movement_type VARCHAR(20),
    quantity INTEGER,
    reference_number VARCHAR(50),
    created_by UUID REFERENCES users(id),
    created_at TIMESTAMP
);
```

User Role Hierarchy:

```
System Roles:
├──── Super Admin (System level)
├──── Procurement Admin (Group level)
│     ├──── Contract management
│     ├──── Supplier management
│     ├──── Group analytics
│     └──── System configuration
├──── Unit Manager (Unit level)
│     ├──── Unit dashboard access
│     ├──── Emergency requisitions
│     ├──── Unit analytics
│     └──── Staff management
├──── Store Manager (Unit level)
│     ├──── Stock receiving/issuing
│     ├──── Inventory management
│     ├──── Daily operations
│     └──── Unit reporting
├──── Store Staff (Unit level)
│     ├──── Basic stock operations
│     ├──── Data entry
│     └──── Limited reporting
└──── Supplier User (External)
      ├──── Supplier portal access
      ├──── Stock level monitoring
      ├──── Order status tracking
      └──── Performance metrics
```

Key System Features Summary

✅ Data Management:

- **CSV Import**: Bulk contract data upload with validation

- **Multi-unit Support**: 8 hotel units with independent operations

- **Batch Tracking**: Full traceability from supplier to consumption

- **Contract Management**: Comprehensive supplier agreement tracking

✅ User Experience:

- **Role-based Dashboards**: Tailored views for each user type

- **Supplier Portal**: External access for proactive supplier management

- **Mobile Responsive**: Works on tablets/phones for store operations

- **Real-time Updates**: Live stock levels and notifications
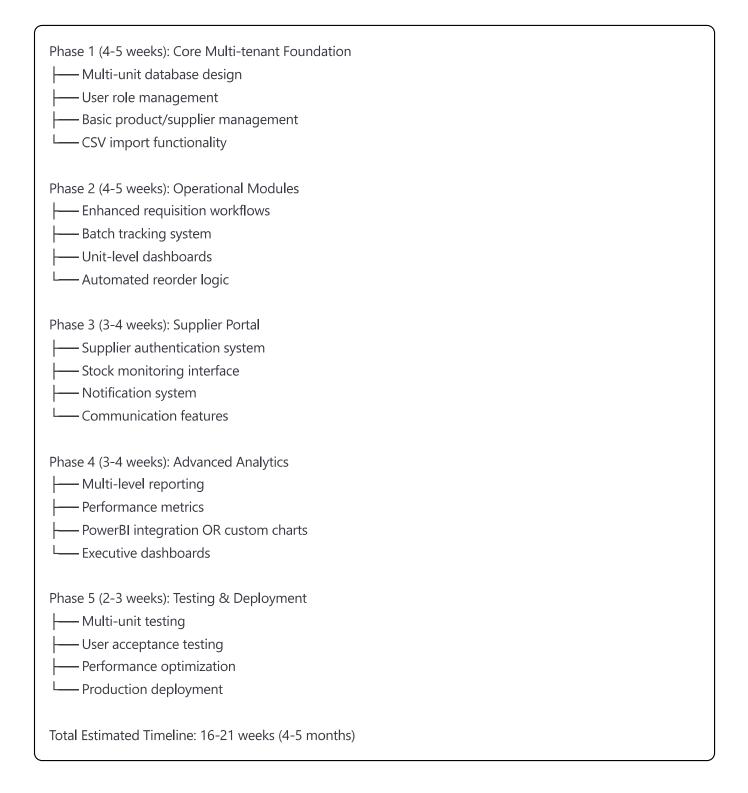
✅ Business Intelligence:

- **Multi-level Analytics**: Group, unit, and product-level insights

- **Performance Metrics**: Supplier, cost, and operational KPIs

- **Trend Analysis**: Historical patterns and forecasting

- **Custom Reporting**: Flexible report generation

✅ Operational Efficiency:

- **Automated Reordering**: Unit-specific supplier selection

- **Emergency Handling**: Rapid response for unexpected demand

- **Approval Workflows**: Appropriate authorization levels

- **Integration Ready**: PowerBI or custom visualization options

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Implementation Complexity Assessment

Development Timeline (Revised):

Phase 1 (4-5 weeks): Core Multi-tenant Foundation
├── Multi-unit database design
├── User role management
├── Basic product/supplier management
└── CSV import functionality

Phase 2 (4-5 weeks): Operational Modules
├── Enhanced requisition workflows
├── Batch tracking system
├── Unit-level dashboards
└── Automated reorder logic

Phase 3 (3-4 weeks): Supplier Portal
├── Supplier authentication system
├── Stock monitoring interface
├── Notification system
└── Communication features

Phase 4 (3-4 weeks): Advanced Analytics
├── Multi-level reporting
├── Performance metrics
├── PowerBI integration OR custom charts
└── Executive dashboards

Phase 5 (2-3 weeks): Testing & Deployment
├── Multi-unit testing
├── User acceptance testing
├── Performance optimization
└── Production deployment

Total Estimated Timeline: 16-21 weeks (4-5 months)

Technical Considerations:

- **Database Design**: More complex multi-tenant architecture

- **Security**: Multiple access levels and external supplier access

- **Performance**: Handling 8 units with concurrent operations

- **Integration**: PowerBI connectivity or advanced charting libraries

- **Scalability**: Designed for potential expansion beyond 8 units

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Business Value Proposition

For Hotel Group:

- **Centralized Control**: Group-wide visibility with unit autonomy

- **Cost Optimization**: Better contract management and bulk purchasing

- **Operational Efficiency**: Automated processes across all units

- **Data-Driven Decisions**: Comprehensive analytics and reporting

For Suppliers:

- **Proactive Service**: Early visibility into stock needs

- **Improved Relationships**: Better communication and performance tracking

- **Business Growth**: Easier expansion to additional units

- **Operational Efficiency**: Reduced reactive order processing

For Store Managers:

- **Simplified Operations**: Automated reordering and streamlined processes

- **Better Control**: Unit-specific dashboards and emergency requisition capability

- **Performance Visibility**: Clear metrics and improvement areas

- **Reduced Stockouts**: Proactive supplier engagement

This system has evolved from a simple inventory management tool to a **comprehensive procurement management platform** suitable for enterprise hotel operations. The complexity is significantly higher, but the business value and competitive advantage it provides make it a strategic investment for the hotel group.