📋 Project Overview

This is a **Travel Booking & Package Management System** designed to automate the booking process for travel packages and tours, transitioning from manual processes to a digital platform. The project uses an **Agile-Scrum** methodology with defined milestones.

🎯 Business Requirements (High-Level)

Based on the presentation, here are the core business requirements:

1. Performance Requirements

- Reduce package booking and confirmation time by **70%**
- Improve data accuracy and inventory tracking to **99.9% reliability**
- Achieve **99.5% system uptime**
- Response time under **5 seconds** per transaction
- Increase online booking conversion rate by **20%**

2. User Experience Requirements

- Modern and intuitive interface
- **24/7 access** to travel catalogs, package customization, and booking management
- User satisfaction above **90%**

3. Operational Requirements

- Real-time inventory management
- Integration with GDS (Global Distribution System) APIs for flights, hotels, and other travel services
- Secure payment processing with SSL and encryption
- Automated booking confirmation and management

⚙️ Functional Requirements

Now, let me break down the **functional requirements** by system module. These are the specific features and capabilities the system must provide:

Module 1: Inventory & Pricing Engine

FR-INV-001: Real-time Inventory Synchronization

- System shall fetch and display real-time availability from external suppliers (flights, hotels, tours)
- System shall integrate with GDS/API providers for live inventory data
- System shall update availability status in real-time (within 5 seconds)

FR-INV-002: Dynamic Pricing Management

- System shall calculate package prices based on multiple components (flights, accommodation, activities, meals, transfers)
- System shall support seasonal pricing and promotional discounts
- System shall automatically update prices when inventory or external factors change

FR-INV-003: Inventory Accuracy Tracking

- System shall maintain 99.9% accuracy in inventory data
- System shall log all inventory changes with timestamps
- System shall alert administrators when inventory discrepancies are detected

Module 2: Dynamic Package Builder

FR-PKG-001: Package Customization

- System shall allow users to create custom travel packages by selecting components:
    - Flight options
    - Accommodation types and hotels
    - Activities and tours
    - Meal plans
    - Ground transfers

FR-PKG-002: Pre-configured Package Templates

- System shall provide pre-arranged package bundles for quick selection
- System shall allow travel agents to create and save package templates

FR-PKG-003: Package Pricing Calculator

- System shall calculate total package price in real-time as components are added/removed
- System shall display itemized breakdown of package costs
- System shall apply bundle discounts automatically

FR-PKG-004: Package Catalog Management

- System shall maintain a searchable catalog of available travel destinations
- System shall support filtering by destination, price range, duration, and travel dates
- System shall display package details with images and descriptions

Module 3: Booking & Payment Gateway

FR-BKG-001: Booking Creation & Management

- System shall allow users to initiate and complete bookings online
- System shall generate unique booking reference numbers
- System shall send booking confirmations via email within 1 minute
- System shall allow booking modifications (subject to supplier policies)
- System shall support booking cancellations with appropriate refund processing

FR-BKG-002: Booking Success Rate

- System shall achieve a booking success rate of at least 95% (bookings completed without technical errors)
- System shall handle booking failures gracefully with clear error messages

- System shall prevent double-bookings and overbooking scenarios

FR-BKG-003: Payment Processing

- System shall integrate with secure payment gateways
- System shall support multiple payment methods (credit/debit cards, online banking, e-wallets)
- System shall use SSL certificates and encryption for all payment transactions
- System shall provide payment confirmation receipts
- System shall handle payment failures with retry mechanisms

FR-BKG-004: Transaction Security

- System shall comply with PCI-DSS standards for payment card data
- System shall encrypt all sensitive customer and payment information
- System shall implement fraud detection mechanisms
- System shall maintain secure audit logs of all transactions

Module 4: Customer Relationship Management (CRM)

FR-CRM-001: User Account Management

- System shall allow travelers to create and manage personal accounts
- System shall store user profiles with contact information and preferences
- System shall maintain booking history for registered users
- System shall support password reset and account recovery

FR-CRM-002: Customer Data Management

- System shall migrate historical booking data from legacy systems
- System shall store customer preferences for personalized recommendations
- System shall maintain customer communication history

FR-CRM-003: Travel Agent Interface

- System shall provide a separate interface for travel agents with enhanced features
- System shall allow agents to create bookings on behalf of customers
- System shall track agent performance and booking statistics

FR-CRM-004: Communication & Notifications

- System shall send automated booking confirmations
- System shall send reminder notifications for upcoming trips
- System shall notify customers of booking changes or cancellations
- System shall support email and SMS notification channels

Module 5: Reporting & Analytics

FR-RPT-001: Sales Reporting

- System shall generate reports on booking volumes and revenue
- System shall track conversion rates (visits to completed bookings)
- System shall provide daily, weekly, and monthly sales summaries

FR-RPT-002: Inventory Reports

- System shall report on inventory utilization and availability trends
- System shall identify popular packages and destinations
- System shall track supplier performance and reliability

FR-RPT-003: Performance Monitoring

- System shall track system uptime and availability
- System shall monitor transaction response times
- System shall log error rates and system failures
- System shall generate alerts for performance degradation

FR-RPT-004: User Analytics

- System shall track user behavior and navigation patterns
- System shall measure user satisfaction through surveys and feedback
- System shall identify drop-off points in the booking funnel

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🔐 Non-Functional Requirements

These are quality attributes and constraints:

Performance
- **NFR-PERF-001**: System response time ≤ 5 seconds for search, pricing, and confirmation
- **NFR-PERF-002**: System shall support concurrent users (specify based on expected load)
- **NFR-PERF-003**: Database queries shall complete within 2 seconds

Availability & Reliability
- **NFR-AVAIL-001**: System uptime of 99.5% (allowing ~3.6 hours downtime per month)
- **NFR-AVAIL-002**: 24/7 accessibility for users
- **NFR-AVAIL-003**: Automated backup every 24 hours with 30-day retention

Security
- **NFR-SEC-001**: SSL/TLS encryption for all data transmission
- **NFR-SEC-002**: PCI-DSS compliance for payment processing
- **NFR-SEC-003**: Role-based access control (RBAC) for different user types
- **NFR-SEC-004**: Regular security audits and penetration testing

Usability
- **NFR-USE-001**: Intuitive interface requiring minimal training
- **NFR-USE-002**: Mobile-responsive design for smartphones and tablets
- **NFR-USE-003**: Support for multiple languages (if applicable)
- **NFR-USE-004**: Accessibility compliance (WCAG standards)

Scalability

- **NFR-SCAL-001**: System architecture shall support horizontal scaling
- **NFR-SCAL-002**: Database design shall handle growing transaction volumes
- **NFR-SCAL-003**: Cloud infrastructure for flexible resource allocation

Maintainability

- **NFR-MAINT-001**: Modular codebase following industry best practices
- **NFR-MAINT-002**: Comprehensive system documentation
- **NFR-MAINT-003**: Automated testing with minimum 80% code coverage
- **NFR-MAINT-004**: Version control and CI/CD pipeline implementation

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🔄 Integration Requirements

IR-001: GDS/API Integration

- System shall integrate with third-party GDS providers (Amadeus, Sabre, Travelport)
- System shall support RESTful API connections
- System shall handle API rate limits and failures gracefully

IR-002: Payment Gateway Integration

- System shall integrate with payment processors (e.g., PayPal, Stripe, local payment gateways)
- System shall support tokenization for stored payment methods

IR-003: Email Service Integration

- System shall integrate with email service providers for transactional emails
- System shall support email templates for different notification types

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📊 Data Requirements

DR-001: Data Migration

- System shall migrate historical booking data from legacy systems
- System shall migrate customer profiles and preferences
- System shall validate data integrity during migration

DR-002: Data Storage

- System shall use cloud storage for scalability
- System shall implement secure backup solutions with 30-day retention
- System shall comply with data protection regulations (e.g., GDPR, Data Privacy Act)

DR-003: Data Accuracy

- System shall maintain 99.9% data accuracy for inventory and pricing
- System shall implement data validation rules for all user inputs

- System shall log all data changes for audit purposes