eCommerce & ERP Integration

Business Requirement Specification (BRS)

Document Information

Item	Details
Project Name	eCommerce & ERP Integration Platform
Document Type	Business Requirement Specification
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Revision History

Version	Date	Author	Changes Description
1.0	November 29, 2025	Abhijeet Kanse	Initial version created

1. Introduction

1.1 Project Purpose & Overview

This Business Requirement Specification document outlines the functional and technical requirements for integrating an eCommerce platform with an ERP system. The integration aims to automate data flow, reduce manual processes, minimize errors, and improve operational efficiency.

Key Business Problems Solved:

- Eliminate manual data entry between eCommerce and ERP systems.
- Resolve inventory discrepancies to prevent overselling.
- Expedite order processing and fulfillment.
- Ensure consistent customer pricing across channels.

1.2 Project Scope

In-Scope Components:

- **Product Data Sync**: Bidirectional synchronization.
- **Customer Data Sync**: New registrations and updates.
- **Order Data Sync**: Automated order creation in ERP.
- **Inventory Sync**: Real-time stock level updates.
- **Pricing Integration**: Customer-specific pricing rules.
- **Reporting Dashboard**: Sales analytics and performance metrics.
- **Approval Workflows**: High-value order review process.

Out-of-Scope Components:

- Third-party shipping carrier integrations.
- Marketing automation and campaign management.
- Accounting and financial reconciliation modules.
- Mobile application development.

1.3 Target Audience

This document is intended for:

- **Development Team**: For system design and implementation.
- **Quality Assurance Team**: For test case creation.
- **Project Managers**: For project planning and tracking.
- **Business Stakeholders**: For requirement validation.
- **System Administrators**: For deployment and maintenance.

1.4 Technical Definitions

Term	Definition
ERP	Enterprise Resource Planning - Backoffice business management system
SKU	Stock Keeping Unit - Unique product identifier
API	Application Programming Interface - System communication method
REST	Representational State Transfer - Web service architecture
SOAP	Simple Object Access Protocol - Web service protocol
Middleware	Integration layer between eCommerce and ERP systems

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2. System Overview

2.1 Integration Architecture

The integration will use a middleware-based architecture to facilitate seamless communication between the eCommerce platform and ERP system. The middleware will handle data transformation, error handling, and synchronization.

2.2 User Roles & Responsibilities

Role	Primary Responsibilities	System Access Level
System Admin	Configuration, monitoring, troubleshooting	Full administrative access
Sales Manager	Approve high-value orders, view reports	Order approval, reporting access
eCommerce Manager	Monitor sync status, manage products	eCommerce admin + integration dashboard
Customer Service	Handle order exceptions, customer queries	Order management, customer data view
Registered Customer	Shop, view prices, place orders	Public website access

3.Detailed Functional Requirements

3.1 Product Data Synchronization

3.1.1 Product Sync from ERP to eCommerce

Business Need: Ensure product information displayed on the eCommerce store matches ERP master data.

Requirement ID	Description	Priority
PROD-SYNC-001	System shall sync new products from ERP to eCommerce within 5 minutes of creation.	High
PROD-SYNC-002	System shall update existing product information (name, description, price) within 10 minutes of ERP changes.	High
PROD-SYNC-003	System shall handle product categorization mapping between ERP and eCommerce categories.	Medium

PROD-SYNC-004	System shall deactivate products in eCommerce when marked inactive in ERP.	High

Product Data Mapping:

ERP Field	eCommerce Field	Data Type	Transformation Rules
ItemCode	sku	Text(50)	Direct mapping, no transformation
ItemName	name	Text(255)	Trim to 255 characters if longer
Description	description	Text	Convert HTML to plain text if needed
BasePrice	price	Decimal(10,2)	Round to 2 decimal places
Weight	weight	Decimal(8,3)	Convert to consistent weight unit (kg)
IsActive	status	Boolean	Map: True = "active", False = "disabled"

3.2 Customer Data Synchronization

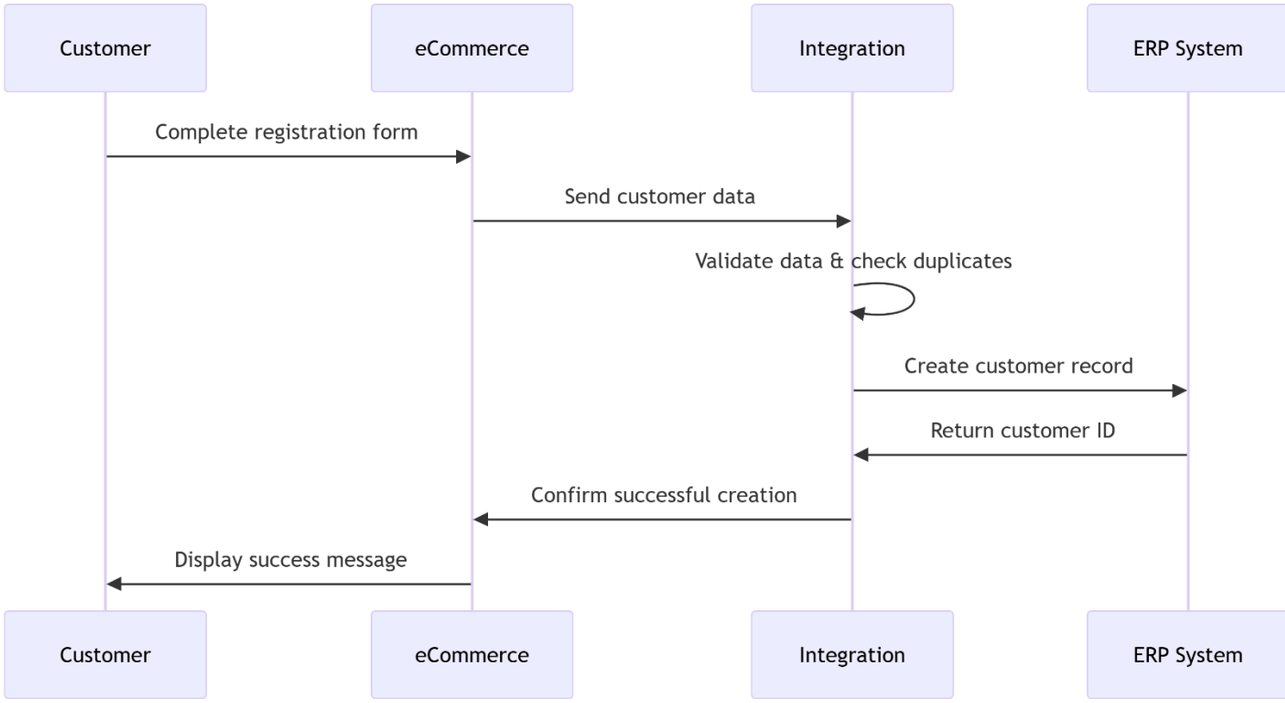
3.2.1 New Customer Registration

Business Need: Automatically create customer records in ERP when users register on the eCommerce site.

Requirement ID	Description	Priority
CUST-SYNC-001	System shall create new customer in ERP within 2 minutes of eCommerce registration.	High
CUST-SYNC-002	System shall assign "Web Customer" classification to eCommerce-registered customers.	Medium

CUST-SYNC-003	System shall validate email uniqueness before creating customer record.	High
CUST-SYNC-004	System shall handle duplicate customer detection using email and name matching.	Medium

Customer Registration Flow:



- User registers on eCommerce.
- Middleware validates data and creates a customer record in ERP.

3.3 Order Management

3.3.1 Order Synchronization to ERP

Business Need: Automatically create sales orders in ERP when customers complete purchases online.

Requirement ID	Description	Priority
ORD-SYNC-001	System shall create ERP sales order within 30 seconds of eCommerce order completion.	High

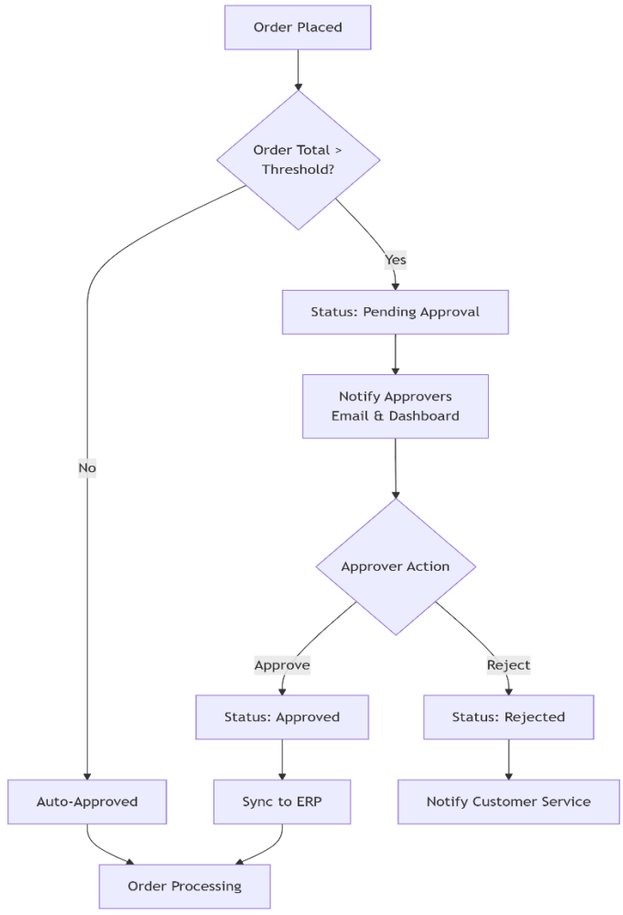
ORD-SYNC-002	System shall sync order status updates from ERP back to eCommerce.	High
ORD-SYNC-003	System shall handle order cancellations and modifications.	Medium
ORD-SYNC-004	System shall support partial order synchronization for large orders.	Low

Order Data Mapping:

eCommerce Field	ERP Field	Data Type	Mapping Logic
order_id	ExternalOrderID	Text(50)	Prefix "WEB-" + order_id
order_date	OrderDate	DateTime	Convert to ERP timezone
grand_total	TotalAmount	Decimal(10,2)	Direct mapping
customer_email	CustomerEmail	Text(100)	Direct mapping
shipping_method	ShipVia	Text(50)	Map to ERP shipping codes

3.3.2 High-Value Order Approval Workflow

Business Need: Require managerial approval for orders exceeding specified value to prevent fraud and manage credit risk.



Approval Requirements:

Requirement ID	Description	Priority
ORD-APPROVAL-001	System shall allow configuration of high-value threshold (default: $5,000).	High
ORD-APPROVAL-002	System shall notify designated approvers via email and dashboard notification.	High
ORD-APPROVAL-003	System shall escalate to secondary approver if no action within 4 hours.	Medium
ORD-APPROVAL-004	System shall automatically cancel orders not approved within 24 hours.	Medium

3.4 Inventory Management

3.4.1 Real-Time Inventory Sync

Business Need: Maintain accurate stock levels across both systems to prevent overselling.

Requirement ID	Description	Priority
INV-SYNC-001	System shall update eCommerce inventory within 2 minutes of ERP stock changes	High
INV-SYNC-002	System shall prevent overselling during high-volume transactions	High
INV-SYNC-003	System shall handle backorder scenarios and display appropriate messages	Medium
INV-SYNC-004	System shall sync inventory across multiple warehouse locations	Medium

Inventory Business Rules:

- When stock ≤ 0, display "Out of Stock" on eCommerce
- When stock < safety stock (configurable), display "Low Stock"
- Reserve inventory for 10 minutes during checkout process
- Sync batch/lot numbers for regulated products

3.5 Customer-Specific Pricing

3.5.1 Personalized Pricing Display

Business Need: Show custom pricing to logged-in customers based on their negotiated contracts.

Requirement ID	Description	Priority
PRICE-001	System shall display customer-specific pricing upon login	High
PRICE-002	System shall hide standard pricing for customers with special pricing	Medium
PRICE-003	System shall cache pricing data for 1 hour to improve performance	Medium
PRICE-004	System shall handle tiered pricing and volume discounts	High

Pricing Logic Flow:

```
IF customer is logged in THEN
GET customer-specific pricing from ERP
IF customer pricing exists THEN
DISPLAY customer-specific price
HIDE standard price
ELSE
DISPLAY standard price
END IF
ELSE
DISPLAY standard price
END IF
```

3.6 Reporting & Analytics

3.6.1 Top Products Report

Business Need: Provide insights into product performance to support business decisions.

Requirement ID	Description	Priority
REPORT-001	System shall generate monthly top 10 products by revenue	High
REPORT-002	System shall provide filtering by date range and category	Medium
REPORT-003	System shall export reports to PDF and Excel formats	Medium
REPORT-004	System shall display month-over-month growth metrics	Low

Report Metrics:

- Top 10 products by revenue
- Top 10 products by quantity sold
- Category-wise performance breakdown
- Comparison with previous period
- Regional sales distribution (if multi-region)

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4. Non-Functional Requirements

4.1 Performance Requirements

Metric	Requirement	Acceptable Value
Order Processing	Time from eCommerce order to ERP creation	< 30 seconds
Inventory Updates	Time from ERP stock change to eCommerce update	< 2 minutes
Pricing Lookups	Response time for customer-specific pricing	< 500 ms
Data Sync	Batch processing of 10,000 products	< 2 hours
System Uptime	Availability during business hours (8 AM - 8 PM EST)	99.5%

4.2 Security Requirements

Requirement ID	Security Control	Implementation
SEC-001	Data Encryption	TLS 1.2+ for all data transmissions
SEC-002	Authentication	OAuth 2.0 for API authentication
SEC-003	Access Control	Role-based permissions for admin functions
SEC-004	Audit Logging	Complete audit trail for all data changes
SEC-005	Data Masking**	Mask sensitive customer data in logs

4.3 Reliability Requirements

Requirement ID	Reliability Aspect	Requirement
REL-001	Error Handling	Graceful handling of ERP system downtime
REL-002	Data Recovery**	Automatic retry with exponential backoff for failed syncs
REL-003	Data Consistency**	Prevent data corruption during network failures
REL-004	Monitoring**	Real-time alerting for system failures

4.4 Usability Requirements

Requirement ID	Usability Aspect	Requirement
USAB-001	Admin Interface	Intuitive dashboard with color-coded status indicators
USAB-002	Error Messages	Clear, actionable error messages with resolution steps
USAB-003	Training	Maximum 2 hours training required for admin users
USAB-004	Documentation	Comprehensive online help and user guides

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5. Technical Specifications

5.1 System Architecture
Integration Pattern: Middleware-based with message queue
Deployment: Cloud-based (AWS/Azure)
Database: PostgreSQL for transaction logging
Caching: Redis for pricing and session data

5.2 API Specifications

5.2.1 eCommerce Platform API

- **Protocol:** REST API
- **Authentication:** OAuth 2.0
- **Rate Limit:** 100 requests/minute
- **Data Format:** JSON

5.2.2 ERP System API

- **Protocol:** SOAP Web Services
- **Authentication:** WS-Security with X.509 certificates
- **Data Format:** XML
- **Batch Support:** Required for initial data loads

5.3 Data Retention Policies

Data Type	Retention Period	Archive Policy
Sync Transaction Logs	90 days	Archive to cold storage after 30 days
Error Logs	180 days	Compress and archive after 90 days
Audit Trails	3 years	Required for compliance
Report Data	2 years	Monthly aggregation after 1 year

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6. Implementation Plan

6.1 Phase 1: Foundation (Weeks 1-4)

- Product data synchronization
- Basic inventory sync
- Error handling framework

6.2 Phase 2: Core Integration (Weeks 5-8)

- Customer data synchronization
- Order creation in ERP
- Admin dashboard development

6.3 Phase 3: Advanced Features (Weeks 9-12)

- Customer-specific pricing
- High-value order approval workflow
- Reporting and analytics

6.4 Phase 4: Optimization (Weeks 13-16)

- Performance tuning
- User acceptance testing
- Production deployment

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7. Assumptions & Constraints

7.1 Assumptions

1. Both eCommerce and ERP systems have stable, documented APIs
2. Sufficient network bandwidth exists between all systems
3. Business users will be available for testing and training
4. Client will provide test environments matching production

7.2 Constraints

1. Cannot modify core ERP system functionality
2. Must use existing eCommerce platform APIs
3. Must comply with company data security policies
4. Integration must support business hours (8 AM - 8 PM EST)

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8. Acceptance Criteria

8.1 Functional Acceptance Tests

- 100 products synchronized correctly in under 2 hours
- New customer created in ERP within 2 minutes of registration
- Order created in ERP within 30 seconds of eCommerce purchase

- Inventory updates reflected on eCommerce within 2 minutes
- Customer-specific pricing displayed correctly for logged-in users

8.2 Performance Acceptance Tests

- System handles 100 concurrent users without performance degradation
- API response times under 500 ms for 95% of requests
- System processes 1,000 orders per hour during peak load

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9. Appendices

9.1 Data Dictionary

Complete field-by-field mapping specifications for all data entities.

9.2 API Documentation

Detailed API specifications and integration guides.

9.3 Error Code Reference

Comprehensive list of error codes and troubleshooting procedures.

Approval Signatures

Role	Name	Signature	Date
Product Owner			
Project Manager			
Lead Developer			
QA Manager			
Business Stakeholder			