Test Cases

Document Control

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Introduction

This document outlines the test cases for validating the implementation of process improvements and system enhancements for the Order Fulfillment Optimization project. These test cases are designed to verify that the implemented solutions effectively address the root causes of order fulfillment delays and meet the functional and non-functional requirements specified in the project documentation.

Test Case Structure

Each test case includes the following information:

- **Test Case ID:** Unique identifier for the test case
- **Test Case Name:** Descriptive name of the test case
- **Requirement ID:** Reference to the requirement being tested
- **Test Objective:** Purpose of the test
- **Test Steps:** Detailed steps to execute the test
- **Expected Results:** Expected outcome of the test
- **Actual Results:** Actual outcome observed during testing (to be completed during test execution)
- **Status:** Pass/Fail/Not Tested
- **Comments:** Additional notes or observations

Address Validation Test Cases

Test Case ID: TC-AV-001

Field	Value
Test Case Name	Real-time Address Validation - Valid Address
Requirement ID	FRD001, FRD002
Test Objective	Verify that the system correctly validates a properly formatted address in real-time during checkout
Test Steps	1. Navigate to the checkout page 2. Enter a valid shipping address with all required fields 3. Proceed to the next step in checkout
Expected Results	• System validates the address in real-time • No validation errors are displayed • User is allowed to proceed to the next step • Address is stored correctly in the order details
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Test with addresses from different regions to ensure comprehensive validation

Test Case ID: TC-AV-002

Field	Value
Test Case Name	Real-time Address Validation - Invalid Address
Requirement ID	FRD001, FRD002
Test Objective	Verify that the system correctly identifies and flags invalid or incomplete addresses
Test Steps	1. Navigate to the checkout page 2. Enter an invalid shipping address (e.g., missing apartment number, incorrect zip code) 3. Attempt to proceed to the next step in checkout
Expected Results	• System validates the address in real-time • Validation errors are displayed with specific details about the issue • Suggestions for correction are provided when possible • User is prevented from proceeding until the address is corrected
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Test with various types of address errors to ensure comprehensive validation

Test Case ID: TC-AV-003

Field	Value
Test Case Name	Address Correction Workflow
Requirement ID	FRD001, FRD002
Test Objective	Verify that the system provides an effective workflow for correcting addresses on existing orders
Test Steps	1. Locate an order with an address flagged for correction 2. Access the address correction workflow 3. Update the address with valid information 4. Save the changes
Expected Results	• System allows authorized users to access the address correction workflow • Current address information is displayed with issues highlighted • Updated address is validated in real-time • Changes are saved and reflected in the order details • Order status is updated appropriately • Shipping carrier is notified of the address change
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Test with orders at different stages in the fulfillment process

Inventory Synchronization Test Cases

Test Case ID: TC-IS-001

Field	Value
Test Case Name	Real-time Inventory Update - Receipt
Requirement ID	FRD004, FRD013
Test Objective	Verify that inventory levels are updated in real-time when new stock is received
Test Steps	1. Process a receipt of new inventory in the WMS 2. Confirm receipt and update inventory levels 3. Check the e-commerce platform for updated inventory
Expected Results	• WMS triggers an inventory change event • Message queue receives and processes the event • E-commerce platform updates inventory levels within 30 seconds • Product availability on the website reflects the new inventory levels • Inventory history log records the transaction
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Test with both small and large quantity receipts

Test Case ID: TC-IS-002

Field	Value
Test Case Name	Real-time Inventory Update - Order Allocation
Requirement ID	FRD004, FRD013
Test Objective	Verify that inventory levels are updated in real-time when stock is allocated to orders
Test Steps	1. Place a new order for a product with limited inventory 2. Allow the system to process the order and allocate inventory 3. Check the e-commerce platform for updated inventory
Expected Results	• Order is processed and inventory is allocated • WMS triggers an inventory change event • Message queue receives and processes the event • E-commerce platform updates available inventory within 30 seconds • Product availability on the website reflects the reduced inventory • If inventory reaches threshold, low stock alert is triggered
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Test with products at different inventory levels, including edge cases

Test Case ID: TC-IS-003

Field	Value
Test Case Name	Inventory Alert System
Requirement ID	FRD004
Test Objective	Verify that the system generates appropriate alerts when inventory levels reach predefined thresholds
Test Steps	1. Identify a product with inventory slightly above the low stock threshold 2. Process an order that reduces inventory below the threshold 3. Monitor the alert system
Expected Results	• System detects inventory falling below threshold • Low stock alert is generated within 1 minute • Alert is delivered via configured channels (dashboard, email, etc.) • Alert includes product details, current inventory level, and recommended action • Alert is logged in the system for audit purposes
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Test with different threshold levels and alert configurations

Pick Path Optimization Test Cases

Test Case ID: TC-PP-001

Field	Value
Test Case Name	Pick Path Algorithm - Single Zone
Requirement ID	FRD003
Test Objective	Verify that the pick path optimization algorithm generates efficient routes for items within a single warehouse zone
Test Steps	1. Create a test order with multiple items from a single warehouse zone 2. Process the order through to the picking stage 3. Generate the optimized pick path 4. Compare with the previous non-optimized path
Expected Results	• System generates an optimized pick path • Path is displayed on the picker's mobile device with clear visual guidance • Total travel distance is at least 20% less than the non-optimized path • Path follows a logical sequence that minimizes backtracking • All items are included in the pick path
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Measure actual travel distance and time for comparison

Test Case ID: TC-PP-002

Field	Value
Test Case Name	Pick Path Algorithm - Multiple Zones
Requirement ID	FRD003
Test Objective	Verify that the pick path optimization algorithm generates efficient routes for items across multiple warehouse zones
Test Steps	1. Create a test order with items from multiple warehouse zones 2. Process the order through to the picking stage 3. Generate the optimized pick path 4. Compare with the previous non-optimized path
Expected Results	• System generates an optimized pick path that efficiently traverses multiple zones • Path is displayed on the picker's mobile device with clear zone transitions • Total travel distance is at least 20% less than the non-optimized path • Path minimizes zone transitions and backtracking • All items are included in the pick path
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Test with various zone combinations and item quantities

Test Case ID: TC-PP-003

Field	Value
Test Case Name	Batch Picking Optimization
Requirement ID	FRD003, FRD005
Test Objective	Verify that the system can optimize pick paths for batch picking across multiple orders
Test Steps	1. Create multiple test orders with some overlapping items 2. Process the orders through to the picking stage 3. Enable batch picking for these orders 4. Generate the optimized batch pick path
Expected Results	• System identifies opportunities for batch picking • Orders are grouped appropriately for batch picking • Optimized pick path includes all items from the batch • Path minimizes travel distance while ensuring order accuracy • Mobile interface clearly indicates which items belong to which orders • System provides guidance for sorting items into order-specific containers
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Test with various batch sizes and order combinations

Integration Test Cases

Test Case ID: TC-INT-001

Field	Value
Test Case Name	End-to-End Order Processing
Requirement ID	Multiple
Test Objective	Verify that the entire order fulfillment process works correctly with all optimizations in place
Test Steps	1. Place a new order on the e-commerce platform 2. Monitor the order as it progresses through each stage of fulfillment 3. Track the order through picking, packing, and shipping 4. Verify delivery confirmation and customer notification
Expected Results	• Order is processed in real-time (no batch delays) • Address validation occurs during checkout • Inventory is allocated immediately • Pick list is generated with optimized pick path • Digital handoffs occur between departments • Shipping label is generated with validated address • Customer receives real-time status updates • Order is fulfilled within the target timeframe
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	This is a comprehensive test that validates the entire process flow

Test Case ID: TC-INT-002

Field	Value
Test Case Name	Exception Handling - Out of Stock
Requirement ID	FRD004, FRD009
Test Objective	Verify that the system handles out-of-stock situations appropriately
Test Steps	1. Identify a product with very low inventory 2. Place multiple orders for this product to deplete inventory 3. Place another order for the now out-of-stock product 4. Monitor system behavior and customer communication
Expected Results	• System accurately tracks inventory depletion in real-time • When inventory reaches zero, product is marked as out of stock • Out-of-stock product is not available for purchase on the website • If backorders are allowed, system clearly indicates extended delivery timeframe • Customer is notified of the inventory situation • Replenishment alert is generated for the warehouse team
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Test with both backorderable and non-backorderable products

Performance Test Cases

Test Case ID: TC-PERF-001

Field	Value
Test Case Name	Order Processing Volume Test
Requirement ID	NFR001, NFR004
Test Objective	Verify that the system can handle peak order volumes without performance degradation
Test Steps	1. Set up a test environment with production-like data 2. Simulate peak order volume (150% of normal daily volume) 3. Monitor system performance metrics 4. Process orders through the entire fulfillment workflow
Expected Results	• System processes all orders without errors • Order status updates occur within 5 seconds • Inventory synchronization completes within 30 seconds • Pick path generation takes less than 3 seconds per order • No significant increase in response times under load • No degradation in accuracy of operations
Actual Results	[To be completed during testing]
Status	Not Tested
Comments	Monitor CPU, memory, and database performance during the test