**DINESWIFT PHASE 2 REQUIREMENTS TRACEABILITY MATRIX (P2 - PHASE 2)**

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| --- | --- | --- | --- |
| **NAME** | **RegNo** | **EMAIL** | **PHONE** |
| Mushabe Moses | 23/U/12131/EVE | Mosesmushae9@gmail.com | 0752307875 |
| Drate Hillary | 23/U/23611 | dratehillary@gmail.om | 0758235980 |
| Mukyala Dorcus Nandy | 23/U/11911/EVE | mukyaladorcus@gmail.com | 0755011795 |
| Kiyimba Fahad | 23/U/0628 | kiyimbafwitty@gmail.com | 0762938957 |

This matrix documents the medium priority use cases, requirements, implementation plan, and detailed test case definitions for Phase 2 (Customer Communication, Loyalty, Inventory, and Dispatch).

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# MEDIUM PRIORITY USE CASES TO REQUIREMENTS MAPPING

## Mobile App Use Cases (P2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Use Case ID** | **Use Case Name** | **Functional Requirements** | **Non-Functional Requirements** | **Priority** | **Test Case ID** | **Sprint** |
| UC-MOB-COMM-013 | Initiate Chat Session | MOBILE-APP-FR-201-P2 | MOBILE-NFR-301-P1, MOBILE-NFR-302-P1 | Medium | MTC-MOB-101 | 3 |
| UC-MOB-COMM-014 | Send Message to Staff | MOBILE-APP-FR-202-P2 | MOBILE-NFR-002-P1 | Medium | MTC-MOB-102 | 3 |
| UC-MOB-COMM-015 | Rate Dining Experience | MOBILE-APP-FR-203-P2 | MOBILE-NFR-301-P1 | Medium | MTC-MOB-103 | 4 |
| UC-MOB-COMM-016 | Provide Detailed Feedback | MOBILE-APP-FR-204-P2 | MOBILE-NFR-301-P1 | Medium | MTC-MOB-104 | 4 |
| UC-MOB-COMM-017 | Rate Specific Waiter | MOBILE-APP-FR-205-P2 | MOBILE-NFR-301-P1 | Medium | MTC-MOB-105 | 4 |
| UC-MOB-LOYALTY-018 | View Loyalty Status | MOBILE-APP-FR-206-P2 | MOBILE-NFR-001-P1 | Medium | MTC-MOB-106 | 3 |
| UC-MOB-LOYALTY-019 | Browse Available Rewards | MOBILE-APP-FR-207-P2 | MOBILE-NFR-002-P1 | Medium | MTC-MOB-107 | 3 |
| UC-MOB-LOYALTY-020 | Redeem Points for Rewards | MOBILE-APP-FR-208-P2 | MOBILE-NFR-002-P1 | Medium | MTC-MOB-108 | 4 |
| UC-MOB-LOYALTY-021 | Track Points Balance | MOBILE-APP-FR-209-P2 | MOBILE-NFR-002-P1 | Medium | MTC-MOB-109 | 3 |

## Local Server Use Cases (P2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Use Case ID** | **Use Case Name** | **Functional Requirements** | **Non-Functional Requirements** | **Priority** | **Test Case ID** | **Sprint** |
| UC-LOCAL-DISPATCH-106 | Monitor Order Readiness | LOCAL-FR-101-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-101 | 3 |
| UC-LOCAL-DISPATCH-107 | Create Delivery Batches | LOCAL-FR-102-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-102 | 3 |
| UC-LOCAL-DISPATCH-108 | Assign Waiter to Batch | LOCAL-FR-103-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-103 | 3 |
| UC-LOCAL-DISPATCH-109 | Optimize Delivery Routes | LOCAL-FR-104-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-104 | 4 |
| UC-LOCAL-DISPATCH-110 | Track Batch Progress | LOCAL-FR-105-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-105 | 4 |
| UC-LOCAL-INVENTORY-111 | Track Stock Levels | LOCAL-FR-106-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-106 | 3 |
| UC-LOCAL-INVENTORY-112 | Trigger Low Stock Alerts | LOCAL-FR-107-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-107 | 3 |
| UC-LOCAL-INVENTORY-113 | Auto-deduct Inventory | LOCAL-FR-108-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-108 | 3 |
| UC-LOCAL-INVENTORY-114 | Calculate Order Suggestions | LOCAL-FR-109-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-109 | 4 |
| UC-LOCAL-COMM-115 | Route Messages in Real-time | LOCAL-FR-110-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-110 | 4 |
| UC-LOCAL-COMM-116 | Prioritize Urgent Requests | LOCAL-FR-111-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-111 | 4 |
| UC-LOCAL-COMM-117 | Store Chat Sessions | LOCAL-FR-112-P2 | LOCAL-NFR-101-P1 | Medium | MTC-LOCAL-112 | 4 |
| UC-LOCAL-LOYALTY-118 | Apply Loyalty Discounts | LOCAL-FR-113-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-113 | 4 |
| UC-LOCAL-LOYALTY-119 | Validate Reward Eligibility | LOCAL-FR-114-P2 | LOCAL-NFR-001-P1 | Medium | MTC-LOCAL-114 | 4 |

## Cloud Server Use Cases (P2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Use Case ID** | **Use Case Name** | **Functional Requirements** | **Non-Functional Requirements** | **Priority** | **Test Case ID** | **Sprint** |
| UC-CLOUD-INVENTORY-208 | Send Orders to Supplier | CLOUD-FR-201-P2 | CLOUD-NFR-001-P1 | Medium | MTC-CLOUD-101 | 3 |
| UC-CLOUD-INVENTORY-209 | Track Order Status | CLOUD-FR-202-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-102 | 3 |
| UC-CLOUD-INVENTORY-210 | Reconcile Payments | CLOUD-FR-203-P2 | CLOUD-NFR-101-P1 | Medium | MTC-CLOUD-103 | 4 |
| UC-CLOUD-INVENTORY-211 | Rate Supplier Performance | CLOUD-FR-204-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-104 | 4 |
| UC-CLOUD-COMM-212 | Aggregate Feedback Data | CLOUD-FR-205-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-105 | 4 |
| UC-CLOUD-COMM-213 | Calculate Performance Metrics | CLOUD-FR-206-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-106 | 4 |
| UC-CLOUD-COMM-214 | Generate Analytics Reports | CLOUD-FR-207-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-107 | 4 |
| UC-CLOUD-LOYALTY-215 | Auto-enroll Customers | CLOUD-FR-208-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-108 | 3 |
| UC-CLOUD-LOYALTY-216 | Track Customer Metrics | CLOUD-FR-209-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-109 | 3 |
| UC-CLOUD-LOYALTY-217 | Manage Tier Progression | CLOUD-FR-210-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-110 | 3 |
| UC-CLOUD-LOYALTY-218 | Calculate Points Earned | CLOUD-FR-211-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-111 | 3 |
| UC-CLOUD-LOYALTY-219 | Update Points Balance | CLOUD-FR-212-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-112 | 3 |
| UC-CLOUD-LOYALTY-220 | Process Reward Redemption | CLOUD-FR-213-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-113 | 4 |
| UC-CLOUD-LOYALTY-221 | Maintain Rewards Catalog | CLOUD-FR-214-P2 | CLOUD-NFR-002-P1 | Medium | MTC-CLOUD-114 | 3 |

## Web App Use Cases (P2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Use Case ID** | **Use Case Name** | **Functional Requirements** | **Non-Functional Requirements** | **Priority** | **Test Case ID** | **Sprint** |
| UC-WEB-KITCHEN-304 | Mark Order Ready (Dispatch) | WEB-APP-FR-101-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-101 | 3 |
| UC-WEB-KITCHEN-305 | View Order Queue | WEB-APP-FR-102-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-102 | 3 |
| UC-WEB-DISPATCH-306 | Receive Batch Assignment | WEB-APP-FR-103-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-103 | 3 |
| UC-WEB-DISPATCH-307 | View Delivery Route | WEB-APP-FR-104-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-104 | 3 |
| UC-WEB-DISPATCH-308 | Verify OTP Delivery | WEB-APP-FR-105-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-105 | 3 |
| UC-WEB-DISPATCH-309 | Mark Delivery Complete | WEB-APP-FR-106-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-106 | 3 |
| UC-WEB-INVENTORY-313 | View Inventory Alerts | WEB-APP-FR-107-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-107 | 4 |
| UC-WEB-INVENTORY-314 | Create Purchase Orders | WEB-APP-FR-108-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-108 | 4 |
| UC-WEB-INVENTORY-315 | Adjust Order Quantities | WEB-APP-FR-109-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-109 | 4 |
| UC-WEB-INVENTORY-316 | Reject Delivery Items | WEB-APP-FR-110-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-110 | 4 |
| UC-WEB-INVENTORY-317 | Capture Rejection Proof | WEB-APP-FR-111-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-111 | 4 |
| UC-WEB-COMM-318 | Receive Customer Messages | WEB-APP-FR-112-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-112 | 4 |
| UC-WEB-COMM-319 | Respond to Customer | WEB-APP-FR-113-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-113 | 4 |
| UC-WEB-COMM-320 | View Customer Feedback | WEB-APP-FR-114-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-114 | 4 |
| UC-WEB-COMM-321 | Handle Urgent Requests | WEB-APP-FR-115-P2 | WEB-NFR-001-P1 | Medium | MTC-WEB-115 | 4 |

## Management Dashboard Use Cases (P2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Use Case ID** | **Use Case Name** | **Functional Requirements** | **Non-Functional Requirements** | **Priority** | **Test Case ID** | **Sprint** |
| UC-DASH-INVENTORY-404 | View Inventory Analytics | DASH-FR-201-P2 | DASH-NFR-001-P2 | Medium | MTC-DASH-101 | 4 |
| UC-DASH-INVENTORY-405 | Analyze Supplier Performance | DASH-FR-202-P2 | DASH-NFR-001-P2 | Medium | MTC-DASH-102 | 4 |
| UC-DASH-COMM-406 | View Staff Performance | DASH-FR-203-P2 | DASH-NFR-001-P2 | Medium | MTC-DASH-103 | 4 |
| UC-DASH-COMM-407 | Analyze Customer Satisfaction | DASH-FR-204-P2 | DASH-NFR-001-P2 | Medium | MTC-DASH-104 | 4 |
| UC-DASH-COMM-408 | Identify Improvement Areas | DASH-FR-205-P2 | DASH-NFR-001-P2 | Medium | MTC-DASH-105 | 4 |
| UC-DASH-LOYALTY-409 | View Loyalty Analytics | DASH-FR-206-P2 | DASH-NFR-001-P2 | Medium | MTC-DASH-106 | 4 |
| UC-DASH-LOYALTY-410 | Identify VIP Customers | DASH-FR-207-P2 | DASH-NFR-001-P2 | Medium | MTC-DASH-107 | 4 |
| UC-DASH-LOYALTY-411 | Configure Reward Programs | DASH-FR-208-P2 | DASH-NFR-001-P2 | Medium | MTC-DASH-108 | 4 |
| UC-DASH-LOYALTY-412 | Personalize Customer Offers | DASH-FR-209-P2 | DASH-NFR-001-P2 | Medium | MTC-DASH-109 | 4 |

# IMPLEMENTATION PRIORITY MATRIX

## Quadrant 1: High Business Value, Medium Complexity (Start Sprint 3)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Use Case** | **Components** | **Requirements** | **Effort** | **Business Value** |
| UC-WEB-DISPATCH-306 | Web App, Local Server | WEB-APP-FR-103-P2, LOCAL-FR-103-P2 | Medium | High |
| UC-LOCAL-INVENTORY-111 | Local Server, Web App | LOCAL-FR-106-P2, WEB-APP-FR-107-P2 | Medium | High |
| UC-CLOUD-LOYALTY-215 | Cloud Server, Mobile App | CLOUD-FR-208-P2, MOBILE-APP-FR-206-P2 | Medium | High |

## Quadrant 2: Medium Business Value, Low Complexity (Quick Wins)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Use Case** | **Components** | **Requirements** | **Effort** | **Business Value** |
| UC-MOB-LOYALTY-018 | Mobile App, Cloud Server | MOBILE-APP-FR-206-P2, CLOUD-FR-209-P2 | Low | Medium |
| UC-WEB-KITCHEN-305 | Web App, Local Server | WEB-APP-FR-102-P2, LOCAL-FR-101-P2 | Low | Medium |
| UC-CLOUD-LOYALTY-221 | Cloud Server | CLOUD-FR-214-P2 | Low | Medium |

# DETAILED TEST CASE DEFINITIONS (CORRECTED)

## **Mobile App Test Cases (P2)**

These test cases validate the core customer-facing communication and loyalty features.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Preconditions** | **Test Steps** | **Expected Result** |
| **TC-MOB-101** | Initiate Chat Session | Customer is authenticated and views the 'Help' screen. | 1. Tap the "Chat with Staff" button. 2. Verify a chat window/interface appears. | A new, active chat session interface loads successfully with a message input field and send button. |
| **TC-MOB-101A** | Offline chat message queuing | Customer's device is in Airplane Mode or has no internet connection. | 1. Customer drafts and attempts to send a message. 2. Customer reconnects to the internet. 3. Check the chat history on both Mobile and Web App. | The message is successfully **queued** on the Mobile App and is sent immediately upon reconnection, appearing in the staff's chat history. |
| **TC-MOB-101B** | Encrypted message transmission | Same as TC-MOB-101. Intercept network traffic between the app and Local Server. | 1. Initiate a chat session. 2. Send a test message ("Secret Test Message 456"). 3. Monitor network packets for the message payload. | The message payload observed in the network traffic must be **encrypted/obfuscated**, confirming protocol compliance for secure chat. |
| **TC-MOB-106** | View Loyalty Status Display | Customer has an active account with a point balance (e.g., 500 points). | 1. Navigate to the Loyalty section. 2. Verify the current tier level (e.g., 'Bronze') and points balance are clearly displayed. | The loyalty status and points balance (e.g., "500 Points, Bronze Tier") are accurately rendered on the screen. |
| **TC-MOB-106A** | Points balance real-time updates | Customer earns 100 points in a new transaction. Customer is currently viewing the Loyalty screen. | 1. Complete a qualifying transaction. 2. Observe the points balance display on the Mobile App. | The points balance updates to the new total (e.g., 600) within **3 seconds** of the transaction being logged by the Cloud Server. |
| **TC-MOB-106B** | Tier progression visualization | Customer is near the next tier (e.g., 90% progress to 'Silver'). | 1. View the Loyalty Status screen. 2. Observe the visual progress bar or indicator. | The visual indicator accurately reflects the customer's current progress toward the next loyalty tier, based on spend or points accumulation. |

## Local Server Test Cases (P2)

These test cases focus on validating the core business logic running on the local restaurant server.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Preconditions** | **Test Steps** | **Expected Result** |
| **TC-LOCAL-101** | Monitor Order Readiness Logic | An order is marked as 'Ready' by the kitchen staff (Web App). | 1. Monitor the Local Server logs/status endpoint for the order ID. 2. Verify the server transitions the order status internally. | The order status is updated from 'Preparing' to 'Ready' within <500**ms** of the kitchen action, triggering the next dispatch step. |
| **TC-LOCAL-101A** | Real-time status updates | Waiter is assigned a batch. The waiter marks the first stop as complete. | 1. Check the Local Server's internal batch tracking status. | The batch status is updated from 'Dispatched' to 'En Route (Stop 1 Complete)' in real-time (<1 second). |
| **TC-LOCAL-101B** | Batch creation triggers | Two orders are marked 'Ready' within 10 seconds of each other. | 1. Wait 15 seconds after the second order is ready. 2. Check the dispatch queue. | The Local Server automatically creates a **single dispatch batch** containing both orders due to the proximity of their readiness times. |
| **TC-LOCAL-106** | Real-time Stock Level Tracking | An ingredient's stock level is 10 units. A new dish uses 2 units. | 1. A new order requiring the ingredient is placed. 2. Check the Local Server's stock database for the ingredient. | The stock level is instantly updated to 8 units in the local database upon order submission. |
| **TC-LOCAL-106A** | Real-time inventory updates | An order is canceled before preparation begins (2 units of Ingredient X are consumed). | 1. Check Ingredient X's current stock level. 2. The order is cancelled. 3. Check the stock level immediately after cancellation. | The stock level for Ingredient X is instantly returned to its pre-order submission value (reversing the consumption). |
| **TC-LOCAL-106B** | Low stock threshold validation | Stock level for Item Y is at 1 unit (threshold is 5). | 1. Check the Local Server's alert log/queue. 2. Temporarily raise the threshold to 10 and re-run validation. | The server correctly generates a **Low Stock Alert** for Item Y when the threshold is 5, and generates a new alert when the threshold is 10. |

## Cloud Server Test Cases (P2)

These test cases validate the cloud services responsible for external communications and data aggregation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Preconditions** | **Test Steps** | **Expected Result** |
| **TC-CLOUD-101** | Order transmission success rate | A Purchase Order (PO) is generated for a supplier via the Web App. | 1. The Cloud Server receives the PO request. 2. Monitor the external API call to the Supplier system. | The Cloud Server successfully transmits the PO data to the supplier and receives an HTTP 200/201 acknowledgment. |
| **TC-CLOUD-101A** | Supplier API integration | Supplier API endpoint is temporarily down (simulate 503 error). | 1. Attempt to transmit a PO. 2. Monitor the Cloud Server's retry attempts. | The Cloud Server attempts to transmit the PO using an **exponential backoff** strategy and logs a critical failure after the maximum retry attempts. |
| **TC-CLOUD-101B** | Order data validation | PO is created with an invalid quantity (e.g., negative number) from the Local Server. | 1. The Cloud Server attempts to validate the incoming PO structure. 2. Check the internal error logs. | The Cloud Server rejects the PO request **before transmission**, logs a validation error, and notifies the originating Local Server. |
| **TC-CLOUD-108** | Auto-enrollment Trigger | A new customer completes their first transaction without a loyalty account. | 1. The transaction is logged on the Cloud Server. 2. Check the Customer Database. | The customer is automatically assigned a new loyalty ID and enrolled in the default loyalty program (CLOUD-FR-208-P2). |
| **TC-CLOUD-108A** | Enrollment trigger validation | Customer completes a transaction but opts-out of the loyalty program during checkout. | 1. Transaction is logged. 2. Check the Customer Database. | The customer is **not** auto-enrolled, and no loyalty ID is assigned, respecting the opt-out flag. |
| **TC-CLOUD-108B** | Duplicate enrollment prevention | Attempt to trigger auto-enrollment for a customer who is already enrolled. | 1. Complete a transaction for an existing member. 2. Monitor the database for a new loyalty profile. | No new loyalty profile is created, preventing data duplication. |

## Web App Test Cases (P2)

These test cases validate the web interface used by staff (kitchen, waiters, managers) for daily operations.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Preconditions** | **Test Steps** | **Expected Result** |
| **TC-WEB-103** | Receive Batch Assignment Notification | A local server assigns a batch of orders (LOCAL-FR-103-P2) to a logged-in waiter. | 1. Waiter is on their dashboard page. 2. Monitor the screen. | A visible, audible, and persistent notification alerts the waiter to the new batch assignment, linking to the details. |
| **TC-WEB-103A** | Real-time batch updates | Waiter begins the batch (status: 'En Route'). Local Server updates the batch status. | 1. Another waiter views the status of the batch on their shared dispatch dashboard. | The batch status updates automatically on the secondary waiter's screen to 'En Route' without manual refresh. |
| **TC-WEB-103B** | Waiter notification reliability | A new batch is assigned while the waiter is viewing another screen (e.g., Inventory). | 1. Waiter navigates to a non-dispatch page. 2. Local Server assigns a batch. | The notification appears as a persistent overlay or badge regardless of the current page being viewed. |
| **TC-WEB-108** | Purchase Order Creation work flow | Manager user is logged into the inventory section. | 1. Open the 'Create PO' form. 2. Enter supplier details and line items. 3. Submit the form. | The form accepts all required input and sends the purchase order request to the Cloud Server for processing. |
| **TC-WEB-108A** | Order quantity validation | Manager attempts to enter a non-numeric value or a negative number for an item quantity on the PO form. | 1. Enter an invalid quantity (e.g., "-5"). 2. Attempt to submit. | The form displays an immediate **client-side validation error** and prevents submission until a valid positive numeric quantity is entered. |
| **TC-WEB-108B** | Supplier selection accuracy | Manager uses the search bar to find Supplier 'FoodCo' but types 'Food Co.'. | 1. Type the misspelled name into the supplier search field. 2. Observe the search results dropdown. | The search function provides relevant results, successfully suggesting 'FoodCo' despite the minor spelling/spacing variation. |

## Management Dashboard Test Cases (P2 & P3)

This section includes the Phase 2 analytics reporting cases, along with the detailed Phase 3 (P3) cases for completeness.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Preconditions** | **Test Steps** | **Expected Result** |
| **TC-DASH-101** | View Inventory Analytics Data Source(accuracy) | Current inventory levels are available from the Local Server. | 1. Navigate to the Inventory Dashboard. 2. Verify that the displayed Stock-Out Risk metric matches the raw calculated data. | All P2 inventory metrics (Stock-Out Risk, Low-Stock Count) are displayed accurately based on the source data. |
| **TC-DASH-101A** | Real-time data updates | Local Server stock drops below the threshold, triggering an alert. | 1. The manager is viewing the Inventory Dashboard. 2. Observe the Low-Stock Count metric. | The Low-Stock Count metric is updated on the Dashboard within **5 seconds** of the Local Server registering the low stock event. |
| **TC-DASH-101B** | Metric calculation validation | Manually calculate the Stock-Out Risk based on 5 high-demand items' data. | 1. Compare the manual calculation against the Dashboard's displayed metric. | The Dashboard's Stock-Out Risk metric matches the manually calculated value with less than 0.01% deviation. |
| **TC-DASH-106** | View Loyalty Analytics Summary(accuracy) | Key customer loyalty metrics (UC-CLOUD-LOYALTY-216) are tracked. | 1. Navigate to the Loyalty Dashboard. 2. View the Total Enrolled Customers and Point Redemption Rate. | The summary metrics are displayed in easily digestible cards/widgets and are numerically accurate. |
| **TC-DASH-106A** | Customer segmentation display | Segmentation rules are applied by the Cloud Server (e.g., VIP → Top 10% spend). | 1. View the Loyalty Dashboard segmentation chart. 2. Verify the customer counts in the displayed segments (e.g., 'VIP', 'Regular'). | The visual display accurately reflects the customer count for each loyalty segment as defined and tracked by the Cloud Server. |
| **TC-DASH-106B** | Program performance metrics | Total points redeemed in the last quarter is 50,000. | 1. Check the Point Redemption Rate metric on the dashboard. 2. Manually calculate the rate (e.g., 50,000/Total Points Issued). | The calculated Redemption Rate metric is displayed accurately and uses the correct input data from the Cloud Server. |

# DETAILED TRACEABILITY SUMMARY

This table summarizes the core traceability for the use cases detailed in Section 3.1.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Component** | **Use Case** | **Implements (FR/NFR)** | **Dependencies** | **Critical Test Cases** |
| **Mobile App** | UC-MOB-COMM-013 (Initiate Chat) | MOBILE-APP-FR-201-P2, MOBILE-NFR-301/302-P1 | LOCAL-FR-110-P2 (Local Server message routing), CLOUD-FR-205-P2 (Cloud Server feedback aggregation) | **TC-MOB-101** (Success Rate), **TC-MOB-101A** (message queuing), **TC-MOB-101B** (Encryption) |
| **Mobile App** | UC-MOB-LOYALTY-018 (View Loyalty Status) | MOBILE-APP-FR-206-P2, MOBILE-NFR-001-P1 | CLOUD-FR-209-P2 (Metrics Tracking), CLOUD-FR-217-P2: (Cloud Server tier progression) | **TC-MOB-106** (Display Accuracy), **TC-MOB-106A** (Points balance Real-time updates), MOB-106B (Tier progression visualization) |
| **Local Server** | UC-LOCAL-DISPATCH-106 (Monitor Order Readiness) | LOCAL-FR-101-P2, LOCAL-NFR-001-P1 | WEB-APP-FR-101-P2 (Order Ready Marking), CLOUD-FR-222-P2 (Cloud Server order tracking) | **TC-LOCAL-101** (Order readiness detection accuracy), **TC-LOCAL-101A** (Real-time status updates), **TC-LOCAL-101B** (Batch Trigger) |
| **Local Server** | UC-LOCAL-INVENTORY-111 (Track Stock Levels) | LOCAL-FR-106-P2, LOCAL-NFR-001-P1 | WEB-APP-FR-107-P2 (Inventory display), CLOUD-FR-225-P2 (Cloud Server inventory tracking) | **TC-LOCAL-106** (Tracking Accuracy), **TC-LOCAL-106A** (Real-time inventory Updates), **TC-LOCAL-106B** (Low stock threshold validation) |
| **Cloud Server** | UC-CLOUD-LOYALTY-215 (Auto-enroll Customers) | CLOUD-FR-208-P2, CLOUD-NFR-002-P1 | MOBILE-APP-FR-206-P2 (loyalty Status Display), CLOUD-FR-209-P2 (Cloud Server customer metrics) | **TC-CLOUD-108** (100% Enrollment accuracy), **TC-CLOUD-108A** (Enrollment trigger validation), **TC-CLOUD-108B** (No Duplicates) |
| **Cloud Server** | UC-CLOUD-INVENTORY-208 (Send Orders to Supplier) | CLOUD-FR-201-P2, CLOUD-NFR-001-P1 | WEB-APP-FR-108-P2 (PO Creation), LOCAL-FR-109-P2 (Local Server order suggestions) | **TC-CLOUD-101** (Success Rate), **MTC-CLOUD-101A** (supplier API Integration), **TC-CLOUD-101B** (Order data validation) |
| **Web App** | UC-WEB-DISPATCH-306 (Receive Batch Assignment) | WEB-APP-FR-103-P2, WEB-NFR-001-P1 | LOCAL-FR-103-P2 (local server Waiter Assignment), LOCAL-FR-104-P2 (Local Server route optimization) | **TC-WEB-103** (batch assignment Display Accuracy), **TC-WEB-103A** (Real-time batch updates) **TC-WEB-103B** (Notification Reliability) |
| **Web App** | UC-WEB-INVENTORY-314 (Create Purchase Orders) | WEB-APP-FR-108-P2, WEB-NFR-001-P1 | LOCAL-FR-109-P2 (Order Suggestions), CLOUD-FR-201-P2 (Cloud Server supplier transmission) | **TC-WEB-108** (purchase order creation Workflow), **MTC-WEB-108A** (order Quantity Validation), **TC-WEB-108B (**Supplier selection accuracy) |
| **Dashboard** | UC-DASH-INVENTORY-404 (View Inventory Analytics) | DASH-FR-201-P2, DASH-NFR-001-P2 | LOCAL-FR-106-P2 (Stock level Data trcking), CLOUD-FR-225-P2 (Cloud Server inventory data) | **TC-DASH-101** (inventory analytics Display Accuracy), **TC-DASH-101A** (Real-time Updates), TC-DASH-101B (Metric calculation validation) |
| **Dashboard** | UC-DASH-LOYALTY-409 (View Loyalty Analytics) | DASH-FR-206-P2, DASH-NFR-001-P2 | CLOUD-FR-209-P2 (Customer Metrics), CLOUD-FR-217-P2 (Cloud Server tier progression) | **TC-DASH-106** (loyalty Analytics Accuracy), **TC-DASH-106A** (customer Segmentation Display), **TC-DASH-106B** (Program performance metrics) |

# SPRINT PLANNING MATRIX

## Sprint 3: Intelligent Operations (Weeks)

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case** | **Component Team** | **Requirements** | **Acceptance Criteria** |
| UC-WEB-DISPATCH-306 | Web Team | WEB-APP-FR-103-P2 | Batch assignment received within 2 seconds |
| UC-LOCAL-INVENTORY-111 | Backend Team | LOCAL-FR-106-P2 | Stock levels tracked with 99% accuracy |
| UC-CLOUD-LOYALTY-215 | Cloud Team | CLOUD-FR-208-P2 | 100% customer auto-enrollment rate |
| UC-MOB-LOYALTY-018 | Mobile Team | MOBILE-APP-FR-206-P2 | Loyalty status loads in <2 seconds |
| UC-WEB-KITCHEN-305 | Web Team | WEB-APP-FR-102-P2 | Order queue displays 50+ orders |
| UC-CLOUD-LOYALTY-221 | Cloud Team | CLOUD-FR-214-P2 | Rewards catalog accessible in <1 second |
| UC-LOCAL-DISPATCH-106 | Backend Team | LOCAL-FR-101-P2 | Order readiness detected in <500 ms |
| UC-LOCAL-DISPATCH-107 | Backend Team | LOCAL-FR-102-P2 | Batches created for ready orders |
| UC-LOCAL-DISPATCH-108 | Backend Team | LOCAL-FR-103-P2 | Waiters assigned within 1 second |
| UC-CLOUD-INVENTORY-208 | Cloud Team | CLOUD-FR-201-P2 | Supplier orders sent with 95% success |
| UC-CLOUD-INVENTORY-209 | Cloud Team | CLOUD-FR-202-P2 | Order status tracked in real-time |
| UC-CLOUD-LOYALTY-216 | Cloud Team | CLOUD-FR-209-P2 | Customer metrics updated in real-time |
| UC-CLOUD-LOYALTY-217 | Cloud Team | CLOUD-FR-210-P2 | Tier progression calculated accurately |
| UC-CLOUD-LOYALTY-218 | Cloud Team | CLOUD-FR-211-P2 | Points calculated for each transaction |
| UC-CLOUD-LOYALTY-219 | Cloud Team | CLOUD-FR-212-P2 | Points balances updated immediately |
| UC-MOB-COMM-013 | Mobile Team | MOBILE-APP-FR-201-P2 | Chat sessions initiated successfully |
| UC-MOB-COMM-014 | Mobile Team | MOBILE-APP-FR-202-P2 | Messages delivered within 5 seconds |
| UC-MOB-LOYALTY-019 | Mobile Team | MOBILE-APP-FR-207-P2 | Rewards catalog loads in <3 seconds |
| UC-MOB-LOYALTY-021 | Mobile Team | MOBILE-APP-FR-209-P2 | Points balance displays accurately |
| UC-WEB-DISPATCH-307 | Web Team | WEB-APP-FR-104-P2 | Delivery routes displayed clearly |
| UC-WEB-DISPATCH-308 | Web Team | WEB-APP-FR-105-P2 | OTP verification process works |
| UC-WEB-DISPATCH-309 | Web Team | WEB-APP-FR-106-P2 | Delivery completion recorded |

## Sprint 4: Advanced Features (Weeks 7-8)

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case** | **Component Team** | **Requirements** | **Acceptance Criteria** |
| UC-MOB-COMM-015 | Mobile Team | MOBILE-APP-FR-203-P2 | Rating submission success >95%**Error! Filename not specified.** |
| UC-MOB-COMM-016 | Mobile Team | MOBILE-APP-FR-204-P2 | Detailed feedback captured |
| UC-MOB-COMM-017 | Mobile Team | MOBILE-APP-FR-205-P2 | Waiter-specific ratings recorded |
| UC-MOB-LOYALTY-020 | Mobile Team | MOBILE-APP-FR-208-P2 | Points redemption processed |
| UC-LOCAL-DISPATCH-109 | Backend Team | LOCAL-FR-104-P2 | Route optimization reduces delivery time by 25%**Error! Filename not specified.** |
| UC-LOCAL-DISPATCH-110 | Backend Team | LOCAL-FR-105-P2 | Batch progress tracked in real-time |
| UC-LOCAL-INVENTORY-114 | Backend Team | LOCAL-FR-109-P2 | Order suggestions 90% accurate |
| UC-LOCAL-COMM-115 | Backend Team | LOCAL-FR-110-P2 | Messages routed within 1 second |
| UC-LOCAL-COMM-116 | Backend Team | LOCAL-FR-111-P2 | Urgent requests prioritized |
| UC-LOCAL-COMM-117 | Backend Team | LOCAL-FR-112-P2 | Chat sessions stored securely |
| UC-LOCAL-LOYALTY-118 | Backend Team | LOCAL-FR-113-P2 | Loyalty discounts applied correctly |
| UC-LOCAL-LOYALTY-119 | Backend Team | LOCAL-FR-114-P2 | Reward eligibility validated |
| UC-CLOUD-INVENTORY-210 | Cloud Team | CLOUD-FR-203-P2 | Payments reconciled accurately |
| UC-CLOUD-INVENTORY-211 | Cloud Team | CLOUD-FR-204-P2 | Supplier performance rated |
| UC-CLOUD-COMM-212 | Cloud Team | CLOUD-FR-205-P2 | Feedback data aggregated |
| UC-CLOUD-COMM-213 | Cloud Team | CLOUD-FR-206-P2 | Performance metrics calculated |
| UC-CLOUD-COMM-214 | Cloud Team | CLOUD-FR-207-P2 | Analytics reports generated |
| UC-CLOUD-LOYALTY-220 | Cloud Team | CLOUD-FR-213-P2 | Reward redemption processed in <1 second |
| UC-WEB-INVENTORY-313 | Web Team | WEB-APP-FR-107-P2 | Inventory alerts displayed |
| UC-WEB-INVENTORY-314 | Web Team | WEB-APP-FR-108-P2 | Purchase orders created in <30 seconds |
| UC-WEB-INVENTORY-315 | Web Team | WEB-APP-FR-109-P2 | Order quantities adjusted |
| UC-WEB-INVENTORY-316 | Web Team | WEB-APP-FR-110-P2 | Item rejection workflow functional |
| UC-WEB-INVENTORY-317 | Web Team | WEB-APP-FR-111-P2 | Rejection proof captured |
| UC-WEB-COMM-318 | Web Team | WEB-APP-FR-112-P2 | Customer messages received |
| UC-WEB-COMM-319 | Web Team | WEB-APP-FR-113-P2 | Responses sent to customers |
| UC-WEB-COMM-320 | Web Team | WEB-APP-FR-114-P2 | Customer feedback viewed |
| UC-WEB-COMM-321 | Web Team | WEB-APP-FR-115-P2 | Urgent requests handled |
| UC-DASH-INVENTORY-404 | Dashboard Team | DASH-FR-201-P2 | Inventory analytics displayed |
| UC-DASH-INVENTORY-405 | Dashboard Team | DASH-FR-202-P2 | Supplier performance analyzed |
| UC-DASH-COMM-406 | Dashboard Team | DASH-FR-203-P2 | Staff performance viewed |
| UC-DASH-COMM-407 | Dashboard Team | DASH-FR-204-P2 | Customer satisfaction analyzed |
| UC-DASH-COMM-408 | Dashboard Team | DASH-FR-205-P2 | Improvement areas identified |
| UC-DASH-LOYALTY-409 | Dashboard Team | DASH-FR-206-P2 | Loyalty analytics viewed |
| UC-DASH-LOYALTY-410 | Dashboard Team | DASH-FR-207-P2 | VIP customers identified |
| UC-DASH-LOYALTY-411 | Dashboard Team | DASH-FR-208-P2 | Reward programs configured |
| UC-DASH-LOYALTY-412 | Dashboard Team | DASH-FR-209-P2 | Customer offers personalized |

# RISK ASSESSMENT BY USE CASE

### High Risk Use Cases

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case** | **Risk** | **Mitigation** | **Owner** |
| UC-LOCAL-DISPATCH-109 | Route optimization algorithm complexity | Pre-calculated routes, fallback to proximity | Backend Team Lead |
| UC-CLOUD-LOYALTY-220 | Points redemption transaction conflicts | Database locking, rollback mechanisms | Cloud Team Lead |
| UC-WEB-INVENTORY-316 | Supplier relationship impact | Clear rejection policies, communication protocols | Web Team Lead |

## Medium Risk Use Cases

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case** | **Risk** | **Mitigation** | **Owner** |
| UC-MOB-COMM-013 | Low user adoption of chat feature | Prominent UI placement, staff training | Mobile Team |
| UC-CLOUD-COMM-212 | Data aggregation performance issues | Incremental processing, caching strategies | Cloud Team |
| UC-DASH-LOYALTY-411 | Complex reward program configuration | Template-based setup, validation rules | Dashboard Team |
| UC-LOCAL-INVENTORY-114 | Inaccurate order suggestions | Machine learning validation, manual override | Backend Team |
| UC-CLOUD-INVENTORY-210 | Payment reconciliation errors | Audit trails, manual review process | Cloud Team |

## Low Risk Use Cases

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case** | **Risk** | **Mitigation** | **Owner** |
| UC-MOB-LOYALTY-018 | Simple display functionality | Standard UI components, fallback states | Mobile Team |
| UC-WEB-KITCHEN-305 | Basic queue display | Pagination, filtering options | Web Team |
| UC-CLOUD-LOYALTY-221 | Static catalog management | CRUD operations, validation | Cloud Team |
| UC-DASH-INVENTORY-404 | Standard analytics display | Chart libraries, data caching | Dashboard Team |

# SUCCESS METRICS TRACKING

|  |  |  |  |
| --- | --- | --- | --- |
| **Use Case** | **Primary Metric** | **Target** | **Measurement Method** |
| UC-LOCAL-DISPATCH-106 | Order Delivery Time | 30% reduction | Order timing analytics |
| UC-CLOUD-LOYALTY-215 | Customer Retention | 15% increase | Repeat customer rate |
| UC-LOCAL-INVENTORY-111 | Stock-out Incidents | 50% reduction | Inventory analytics |
| UC-MOB-COMM-013 | Response Time | <2 minutes | Chat response metrics |
| UC-CLOUD-INVENTORY-208 | Order Accuracy | 95%+ | Supplier reconciliation reports |
| UC-WEB-DISPATCH-306 | Waiter Efficiency | 20% improvement | Orders per hour metrics |
| UC-MOB-LOYALTY-020 | Redemption Rate | 25% of points redeemed | Loyalty program analytics |
| UC-CLOUD-COMM-212 | Feedback Collection | 40% of customers provide feedback | Rating system analytics |
| UC-DASH-INVENTORY-404 | Manager Adoption | 70% use dashboard weekly | Dashboard usage analytics |
| UC-LOCAL-DISPATCH-109 | Route Efficiency | 25% distance reduction | GPS tracking analytics |

# CROSS-COMPONENT DEPENDENCIES AND BUSINESS OUTCOMES

## **Dependencies for P2**

**Cross-Component Dependencies:**

* **Loyalty System:** Mobile App (Loyalty UI) → Cloud Server (Points Calculation) → Local Server (Discount Application)
* **Intelligent Dispatch:** Web App (Kitchen) → Local Server (Batch Creation) → Web App (Waiter) → Mobile App (OTP Verification)
* **Inventory Management:** Local Server (Stock Tracking) → Web App (Manager Alerts) → Cloud Server (Supplier Orders) → Supplier Systems
* **Communication System:** Mobile App (Customer Chat) → Local Server (Message Routing) → Web App (Staff Response) → Cloud Server (Analytics)

**Phase Dependencies:**

* **P1 Foundation Required:** All P2 features build on P1 core systems.
* **Payment System:** Loyalty points depend on payment processing from P1.
* **Menu System:** Inventory management requires menu item data from P1.
* **Order System:** Dispatch system requires order processing from P1.
* **Booking System:** Customer metrics integrate with booking data from P1.

## Phase 2 Business Outcomes

#### **Operational Improvements:**

* 30% **faster order delivery** through intelligent dispatch
* 50% **reduction in stock-outs** via inventory management
* 25% **increase in waiter efficiency** with optimized routing

#### **Customer Experience:**

* 15% **higher customer retention** via loyalty program
* 40% **feedback collection rate** through communication system
* 25% **points redemption rate** driving repeat business

#### **Business Intelligence**:

* 70% **manager adoption** of analytics dashboard
* Real-time operational insights for decision making
* Data-driven supplier management improving costs