TASHEEL HEALTHCARE PLATFORM
Detailed Process Note & Comprehensive Requirements

Document Date: January 3, 2026
Platform Type: Lab Aggregator Platform (Talabat Model for Laboratory Testing)
Scope: End-to-end workflow from test discovery to Smart Health Reports with Teleconsultation

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EXECUTIVE SUMMARY

Tasheel HealthConnect is a multi-vendor lab aggregator platform enabling users to:
1. **Discover & Compare** lab tests and pricing from multiple vendor partners
2. **Book & Pay** online with home collection or walk-in options
3. **Collect Samples** via trained phlebotomists with real-time tracking
4. **Deliver Samples** via dedicated riders to appropriate lab partners
5. **Process Tests** through outsourced lab partners
6. **Generate Smart Reports** with interactive organ system analysis and health insights
7. **Consult** with doctors via teleconsultation for next steps

Business Model: Tasheel acts as the aggregator handling customer interface, phlebotomist pool, delivery logistics, and smart report conversion. Lab partners handle test processing and report generation.

SECTION 1: QUICK LAUNCH PHASES (Weeks 1-8)

QL 1.0: Admin Dashboard Foundation & Patient App Base (Weeks 1-4)

Process Flow: Core System Setup

Phase Objective: Establish operational backbone and customer-facing interface

Step 1: Admin Dashboard - Booking Management
- **Process:** Display all bookings received from patient app/web in real-time dashboard
- **Data Captured:**
  - Booking ID, Timestamp, Customer Name, Phone
  - Test(s) selected, Lab Partner, Preferred Slot
  - Collection address, Special requirements (difficult vein, fasting instructions)
  - Payment status (pending/completed/offline)
  - Phlebotomist assignment status
- **User Actions:**

- Admin views all bookings in status: "Pending", "Confirmed", "In Progress", "Completed", "Cancelled"
  - Approve or reject bookings (show reason for rejection)
  - Manual assignment of phlebotomists if required
  - Generate booking confirmation (SMS/Email notification to customer)
- **Technology:** Web portal (Node.js/React), Real-time updates via WebSocket
- **Estimated Effort:** 2 days

Step 2: Admin Dashboard - Email Notifications
- **Process:** Send automated email to admin for critical events
- **Triggers:**
  - New booking created
  - Payment received
  - Booking cancelled/rescheduled
  - Sample collected status update
  - Report uploaded
  - Booking exceeds SLA
- **Email Content:** Summary of action required, booking details, customer contact
- **Technology:** Email service integration (SendGrid, AWS SES)
- **Estimated Effort:** 2 days

Step 3: Patient App - Home Screen with Test Categories
- **Process:** Intuitive mobile UI showing test categories and popular tests
- **UI Components:**
  - Search bar (search by test name, condition, symptom)
  - Category carousel (General Health, Heart Health, Diabetes, Women's Health, Fertility, COVID-19, etc.)
  - Popular/Trending tests widget (based on bookings in last 30 days)
  - Quick access buttons: "Browse All Tests", "My Recent Tests", "My Family", "My Reports"
  - Banner space for vendor positioning (revenue opportunity)
- **Backend Logic:**
  - Pull test categories and popular tests from Lab Masters
  - Cache popular tests for faster loading
  - Personalization based on customer's past bookings and profile
- **Technology:** Flutter (iOS/Android), API integration with Node.js backend
- **Estimated Effort:** 5 days

Step 4: Patient App - About Us & Contact Information
- **Process:** Static pages explaining Tasheel value proposition
- **Content Sections:**
  - "What is Tasheel HealthConnect?" - Platform explanation, key features
  - "Why Use Tasheel?" - Unique value propositions (price comparison, home collection, smart reports)
  - "How It Works?" - 4-step visual explanation (Discover → Book → Collect → Report)
  - "Contact Us" - In-app chat, WhatsApp link, phone support hours, email
  - "FAQs" - Common questions about booking, collection, results, smart reports
- **Technology:** Static content management, markdown-based CMS

- **Estimated Effort:** 2 days

Step 5: Patient App - Browse Tests & Pricing
- **Process:** Display all available tests from all lab partners with price comparison
- **User Journey:**
  1. User searches or browses by category
  2. App shows list of available tests with:
     - Test name, Sample type (Blood, Urine, etc.)
     - Description of test (what it measures)
     - Price comparison table (show 3-5 lab partners with different prices)
     - Ratings of each lab (based on customer feedback)
     - Turnaround time (TAT) for results
     - Lab location/service zone coverage
  3. User taps on lab to see full details and book
- **Data Source:** Lab Master (test catalog with pricing from each vendor)
- **Smart Logic:**
  - Highlight most affordable option
  - Show labs available in user's service zone (based on geolocation)
  - Filter by TAT, rating, price
- **Technology:** Mobile app (Flutter), API integration with backend database
- **Estimated Effort:** 4 days

Step 6: Patient App - Download Reports
- **Process:** Access and download previously uploaded reports
- **Features:**
  - List all past reports organized by date (newest first)
  - Filter by test type, date range, lab partner
  - Download report as PDF
  - Email report to self or family member
  - Share report with doctor (secure link with expiry)
- **Technology:** PDF generation (pdfkit or similar), cloud storage (Google Cloud/AWS)
- **Estimated Effort:** 2 days

Step 7: Patient App - Profile Settings & Notifications
- **Process:** Manage user preferences and notification settings
- **Profile Features:**
  - Edit profile (name, age, DOB, blood type, allergies, medications)
  - Change password/authentication
  - Notification preferences (SMS, Email, WhatsApp, push)
  - Language selection (English/Arabic)
  - Manage address book (home, office, other collection points)
- **Technology:** Mobile settings UI, backend profile storage
- **Estimated Effort:** 2 days

Step 8: Patient App - Email Alerts
- **Process:** Send email to customer for key booking events
- **Triggers:**
  - Booking confirmation
  - Phlebotomist assigned & ETA

- Sample collected
  - Sample delivered to lab
  - Report ready
  - Report reminder (if not downloaded in 7 days)
- **Email Templates:** HTML-based, mobile-responsive
- **Technology:** Email service API integration
- **Estimated Effort:** 1 day

Step 9: Admin Dashboard - Role-Based Login (Partial)
- **Process:** Admin, Ops, Support personnel login with role-specific access
- **Roles Defined:**
  - **Admin:** Full access (dashboard, users, labs, reports, billing)
  - **Ops (Operations Manager):** Booking management, phlebotomist assignment, issue resolution
  - **Support:** Customer support, ticket tracking, feedback management
- **Features:**
  - Email/phone login with OTP
  - Password management
  - Session timeout (15 min inactivity)
  - Audit logging of user actions
- **Technology:** JWT authentication, role-based access control (RBAC)
- **Estimated Effort:** 3 days

Step 10: Admin Dashboard - Notifications Integration (Partial)
- **Process:** Admin receives SMS/Email/WhatsApp alerts (WhatsApp integration pending 3rd party)
- **Features (Phase 1):**
  - Email alerts to admin for bookings, cancellations, issues ✓
  - SMS alerts (subject to 3rd party integration)
  - WhatsApp alerts (deferred pending integration)
- **Note:** Email fully functional from QL 1.0; SMS and WhatsApp enabled upon 3rd party readiness
- **Technology:** Multi-channel notification engine, queue-based processing
- **Estimated Effort:** 10 days (with 3rd party delays factored)

Step 11: Admin Dashboard - Content Management
- **Process:** Edit FAQs, Terms & Conditions, Help pages
- **Features:**
  - WYSIWYG editor for creating content
  - Version control and publication workflows
  - Scheduled publishing (publish on specific date/time)
  - Mobile preview
- **Content Types:**
  - FAQs (categorized by topic)
  - Terms & Conditions
  - Privacy Policy
  - Help guides
  - Announcements/Banners
- **Technology:** CMS module, content versioning
- **Estimated Effort:** 8 days

Step 12: Patient App - Lab Selection & Checkout (Partial)

- **Process:** Select lab, date, time, address, and proceed to payment
- **User Flow:**
  1. User selects test → shown available labs with prices
  2. Selects preferred lab
  3. Chooses collection date/time (available slots)
  4. Enters/confirms collection address (with map verification)
  5. Adds patient details if new user:
     - Full name, DOB, Gender, Email, Phone
     - Health info (blood type, allergies, medications)
     - Fasting requirement (if applicable)
  6. Review summary
  7. Proceed to payment (or pay offline option)
- **Payment Gateway:** Integration with payment provider (Stripe, PayPal, local processor)
- **Offline Payment Option:** If online payment fails, offer offline (COD/Bank Transfer)
- **Data Validation:**
  - Check if patient already registered (by phone or email)
  - If new, register patient in system
  - Store address for future bookings
- **Technology:** React/Flutter UI, payment gateway API, address validation (Google Maps)
- **Estimated Effort:** 10 days

Step 13: Patient App - Booking Tracking & History
- **Process:** Track booking status in real-time and view past bookings
- **Features:**
  - Current booking status (Confirmed → Collection Scheduled → Collected → Delivered → In Lab → Report Ready → Delivered to Customer)
  - Estimated phlebotomist arrival time (once assigned)
  - Phlebotomist contact: call/chat button
  - Payment receipt
  - Report link once ready
- **History:**
  - List of all past bookings
  - Filter by date, lab, test type
  - Reorder: quick re-booking of previous tests
- **Real-Time Updates:** WebSocket connection to push status changes
- **Technology:** Real-time status tracking, WebSocket, local notifications
- **Estimated Effort:** 5 days

Step 14: Testing & UAT - QL 1.0
- **Process:** Comprehensive testing of all features before go-live
- **Testing Scope:**
  - Functional testing: Each feature per specifications
  - Integration testing: API, payment gateway, notification services
  - User acceptance testing: Client team validates against requirements
  - Performance testing: Load testing (concurrent users)
  - Security testing: SQL injection, XSS, CSRF, authentication
- **UAT Deliverables:** Bug log, test cases, sign-off document
- **Technology:** Jest/Mocha (unit testing), Postman (API testing), Jest/Cypress (E2E testing)
- **Estimated Effort:** 10 days

QL 2.0: Outsourced Lab Portal (Weeks 5-6)

Process Flow: Lab Partner Integration

Step 1: Lab Portal - Sample Acknowledgment
- **Process:** Lab partner acknowledges receipt of samples
- **Workflow:**
  1. Rider delivers samples to lab with barcode/list
  2. Lab staff scan barcodes or manually enter sample IDs
  3. Count samples and verify against delivery list
  4. Note any discrepancies (missing samples, damaged vials, etc.)
  5. Click "Acknowledge Receipt" with timestamp
  6. System sends confirmation to admin + customer via SMS/email
- **Data Captured:**
  - Sample ID, Test type, Patient name
  - Received quantity, Any damage noted
  - Received time, Received by (lab staff name)
- **Technology:** Web portal (Node.js/React), Barcode scanner integration
- **Estimated Effort:** 3 days

Step 2: Lab Portal - Result Upload
- **Process:** Lab uploads test results in standardized format
- **Workflow:**
  1. Lab completes testing and generates report
  2. Lab staff logs into Tasheel Lab Portal
  3. Uploads results in bulk (CSV/Excel or manually per patient)
  4. System validates data format and links to correct patient/test
  5. Results marked as "Ready"
  6. System triggers notification to patient that report is ready
- **Data Format:**
  - CSV: Sample ID, Test Code, Result, Reference Range, Status
(Normal/Abnormal)
  - Or: Manual entry via form
- **Validation:** Auto-check for data consistency, required fields,
numeric ranges
- **Technology:** File upload handler, CSV parser, data validation engine
- **Estimated Effort:** 3 days

Step 3: Lab Portal - View Bookings
- **Process:** Lab partner can see bookings assigned to them
- **Features:**
  - Dashboard showing today's bookings
  - Filter by date, test type, status
  - Download booking list for printing
  - Cancel/reschedule request (in case of issues)
  - Add notes for patient (fasting requirements, sample prep)
- **Technology:** Report dashboard, data export
- **Estimated Effort:** 3 days

Step 4: Testing & UAT - QL 2.0
- **Process:** Test lab portal features

- **Scope:** Lab staff can acknowledge samples and upload results without errors
- **Estimated Effort:** 5 days

QL 3.0: Admin Logistics & Billing (Weeks 7-8)

Process Flow: Operations & Finance

Step 1: Admin Dashboard - Lab Management (Add/Edit Labs)
- **Process:** Admin manages lab partner master data
- **Features:**
  - Add new lab partner (name, address, contact, bank details)
  - Edit lab details (operating hours, service zones, specialties)
  - Toggle lab active/inactive
  - Manage lab staff users (who can access the lab portal)
  - View lab performance metrics (tests completed, turnaround time, customer rating)
- **Data Captured:**
  - Lab name, address, phone, email, website
  - Contact person details
  - Bank account (for payouts)
  - Operating hours, holidays
  - Service zones (areas they serve)
  - Tests offered (link to test master)
  - Pricing (price they charge for each test)
- **Technology:** Admin form interface, database table management
- **Estimated Effort:** 5 days

Step 2: Admin Dashboard - Manual Phlebotomist Assignment
- **Process:** Assign phlebotomist to bookings manually
- **Workflow:**
  1. Admin sees pending bookings in dashboard
  2. Selects a booking
  3. Views available phlebotomists (online, service zone match, current load)
  4. Assigns to chosen phlebotomist
  5. Phlebotomist receives notification (push, SMS) with booking details
  6. Booking status changes to "Assigned"
- **Logic:**
  - Show phlebotomists available in customer's area
  - Consider current workload (number of bookings)
  - Preference for repeat customers (assign same phlebotomist if available)
- **Technology:** User interface with assignment logic, notification engine
- **Estimated Effort:** 2 days

Step 3: Admin Dashboard - Delivery/Pickup Task Management
- **Process:** Create and assign delivery tasks to riders
- **Workflow:**
  1. Admin sees samples ready for delivery (collected, waiting to go to lab)

2. Creates delivery task (group samples by destination lab)
   3. Assigns rider with available time slot
   4. Rider receives notification
   5. Track rider GPS movement
- **Task Details:**
   - List of samples to deliver
   - Source (collection center or individual address)
   - Destination (lab partner)
   - Special requirements (temperature control, fragile, etc.)
   - Pickup time window, Delivery time window
- **Technology:** Task assignment UI, GPS tracking integration
- **Estimated Effort:** 3 days

Step 4: Admin Dashboard - Walk-In Booking Management
- **Process:** Register and book walk-in customers at collection center
- **Workflow:**
   1. Walk-in customer arrives at collection center
   2. Collection center staff opens Tasheel admin portal
   3. Searches for existing customer by phone/CPR/ID
   4. If new customer, registers:
      - CPR/Emirates ID/Iqama (national ID)
      - Name, phone, email, DOB, nationality, blood type
      - Health info (allergies, medications)
      - Profile completeness score (aim for 100% to unlock offers)
   5. Selects tests from catalog
   6. Chooses lab partner (if multiple available)
   7. Completes payment (cash, card on-site)
   8. Generates receipt/token
   9. Phlebotomist collects sample immediately
   10. Booking marked as "Sample Collected"
- **Features:**
   - Offline mode (in case internet down)
   - Special options: difficult vein flag, preferred phlebotomist, fasting status
   - Show incentive offers based on profile completeness
- **Technology:** Offline-capable web app, biometric ID scanner integration (optional)
- **Estimated Effort:** 3 days

Step 5: Admin Dashboard - Booking Status Updates
- **Process:** Track and update booking status at each stage
- **Status Flow:**
   1. **Pending** → Awaiting payment confirmation
   2. **Confirmed** → Payment received, phlebotomist to be assigned
   3. **Assigned** → Phlebotomist assigned, awaiting collection
   4. **In Transit** → Phlebotomist en-route to customer (GPS tracking)
   5. **Collected** → Sample collected, awaiting delivery to lab
   6. **Delivered to Lab** → Rider delivered to lab partner
   7. **In Lab** → Lab processing the test
   8. **Report Ready** → Lab uploaded results
   9. **Report Delivered** → Patient viewed/downloaded report
   10. **Completed** → Workflow finished, payment settled
   11. **Cancelled** → Cancelled by customer or admin
- **Admin Actions:**

- Manually update status (if system sync fails)
  - Add notes (delays, issues, customer feedback)
  - Retry status sync if failed
- **Technology:** Status state machine, workflow engine
- **Estimated Effort:** 2 days

Step 6: Admin Dashboard - Order Payment History
- **Process:** View and reconcile customer payments
- **Features:**
  - List all orders with payment status
  - Filter by date range, payment method, status
  - View payment breakdown (test charges, discount, total, payment method)
  - Search by order ID, customer phone
  - Download payment report (CSV/Excel)
  - Reconcile with payment gateway (match reported vs actual)
- **Payment Methods Tracked:**
  - Online (credit/debit card)
  - Offline (cash, bank transfer, cheque)
  - Insurance (if applicable)
- **Technology:** Financial reporting dashboard, payment gateway API
- **Estimated Effort:** 3 days

Step 7: Admin Dashboard - Bill Generation
- **Process:** Create and send invoices to customers
- **Features:**
  - Auto-generate bill after sample collection
  - Show itemized test charges (Test name, Price, Discount, Net)
  - Include payment details and receipt
  - Send via email and WhatsApp (with secure link to download)
  - Print-friendly format
  - Store bill for audit trail (minimum 5 years)
- **Bill Content:**
  - Invoice #, Date, Booking reference
  - Customer name, address, phone, email
  - Tests performed, date collected
  - Lab partner name
  - Itemized charges
  - Total amount, payment method, payment date
  - Cancellation policy
  - Tasheel contact for disputes
- **Technology:** PDF generation (pdfkit or similar), email/WhatsApp integration
- **Estimated Effort:** 3 days

Step 8: Admin Dashboard - Billing Monthly Reports
- **Process:** Generate financial reports for management review
- **Reports Available:**
  - Revenue summary (total bookings, total revenue, by lab partner, by test type)
  - Payment collection summary (cash, online, pending)
  - Customer acquisition (new vs repeat, by source)
  - Lab partner performance (tests completed, revenue share, rating)

- Phlebotomist performance (tests collected, customer rating, utilization)
  - Operational metrics (average TAT, cancellation rate, re-bookings)
- **Features:**
  - Date range selection
  - Filter by lab, test, phlebotomist, source
  - Export to Excel/PDF
  - Charts/graphs (pie charts, bar charts, trend lines)
  - Year-on-year comparison
- **Technology:** Business intelligence/reporting tool (PowerBI, Tableau, or custom)
- **Estimated Effort:** 3 days

Step 9: Testing & UAT - QL 3.0
- **Process:** Full system testing across all components
- **Scope:**
  - Lab management features
  - Phlebotomist assignment
  - Delivery task management
  - Walk-in booking workflow
  - Status tracking
  - Payment history and bill generation
  - Billing reports
- **Estimated Effort:** 10 days

SECTION 2: PHASE 1.0 - MOBILE APPS (Weeks 9-20)

Process Flow: Phlebotomist & Rider Applications

Step 1: Phlebotomist App - Core Login & Status
- **Process:** Phlebotomist logs in and sets availability
- **Features:**
  - Phone number + OTP login
  - Set status: Online/Offline
  - Show when online (customer can see phlebotomist availability)
  - Location permission (required for GPS tracking)
  - Receive push notifications for new bookings
- **Technology:** Flutter app, JWT authentication, push notification service
- **Estimated Effort:** 4 days

Step 2: Phlebotomist App - Assigned Tasks List
- **Process:** View all assigned collection tasks
- **Display:**
  - Task card showing:
    - Customer name, phone, address
    - Test(s) to be collected
    - Collection time slot
    - Special requirements (fasting, difficult vein)
    - Sample type (blood, urine, etc.)
    - Collection status (pending, accepted, in transit, collected)
  - Sorted by time (urgent first)

- Color-coded by urgency
- **Actions:**
  - Accept task (phlebotomist confirms availability)
  - View full details (click to expand)
  - Navigate to customer address (opens maps)
  - Call/chat customer directly from app
  - Mark as "In Transit"
  - Mark as "Arrived"
- **Technology:** Flutter UI, real-time task sync via WebSocket
- **Estimated Effort:** 4 days

Step 3: Phlebotomist App - One-Tap Call/Chat
- **Process:** Direct communication with customer and lab
- **Features:**
  - One-tap phone call (dialer integration)
  - In-app chat (text messages)
  - Pre-written templates for common messages:
    - "I'm 5 minutes away"
    - "I've arrived"
    - "Customer not available, rescheduling"
  - Chat history (last 10 messages per customer)
  - Call logs
- **Technology:** Phone API integration, in-app chat backend
- **Estimated Effort:** 5 days

Step 4: Phlebotomist App - GPS Tracking
- **Process:** Real-time location tracking and navigation
- **Features:**
  - Background GPS tracking (consumes minimal battery)
  - Navigate to customer address (integrated Google Maps)
  - Show customer location on map
  - ETA to customer (automatic calc)
  - Route optimization (if multiple stops)
  - Geofence alerts (notify when within 500m of customer)
  - Track distance traveled (for odometer)
- **Privacy:** Customer sees phlebotomist arrival ETA in real-time
- **Technology:** GPS service, Google Maps API, geofencing library
(Flutter Geolocator)
- **Estimated Effort:** 7 days

Step 5: Phlebotomist App - Payment Collection
- **Process:** Collect payment from customer (if not pre-paid online)
- **Features:**
  - Show amount due
  - Record payment method received:
    - Cash (photo of cash for audit trail)
    - Card (card reader integration)
    - Mobile wallet (Apple Pay, Google Pay)
  - Generate receipt on app
  - Note any balance due
  - Mark order as "Paid" or "Balance Due"
- **Reconciliation:** End-of-day closing (total cash collected vs
bookings)

- **Technology:** Payment terminal integration (Square, Verifone), receipt printing via Bluetooth
- **Estimated Effort:** 5 days

Step 6: Phlebotomist App - Daily Visits Dashboard
- **Process:** Overview of day's schedule
- **Display:**
  - Today's tasks (count, total revenue)
  - Tasks by time slot (8am, 9am, 10am, etc.)
  - Completion rate (tasks completed / assigned)
  - Performance badge (if high ratings/completion rate)
  - Earnings today (total payment collected + commissions)
  - Distance traveled, time spent
- **Actions:**
  - View detailed task list
  - Accept all pending tasks
  - Notify admin of issues (unable to collect, customer unavailable)
- **Technology:** Dashboard UI, real-time data aggregation
- **Estimated Effort:** 4 days

Step 7: Phlebotomist App - Multi-Patient Booking
- **Process:** Manage multiple customers in same location (family)
- **Workflow:**
  1. Phlebotomist arrives at address with multiple bookings
  2. Selects each family member from list
  3. Collects samples for each (different vials/tubes)
  4. Marks each sample with barcode
  5. Collects payment from household (single payment or per person)
  6. Marks all as "Collected"
- **Features:**
  - Group view (family members at same address)
  - Batch collection acknowledgement
  - Single payment for household
  - Individual sample tracking
- **Technology:** Multi-select UI, barcode generation
- **Estimated Effort:** 6 days

Step 8: Phlebotomist App - Sample Collection Acknowledgement
- **Process:** Confirm sample collected and prepare for delivery
- **Workflow:**
  1. After sample collection, phlebotomist scans barcode or manually enters sample ID
  2. Photo of sample taken (for audit trail)
  3. Checks vial integrity (no leakage, correct label)
  4. Confirms sample type matches test requirement
  5. Clicks "Sample Collected"
  6. System updates status to "Collected" and notifies customer + lab
  7. Phlebotomist stores sample in appropriate container (temperature-controlled if needed)
- **Data Captured:**
  - Sample ID, collection time, phlebotomist ID
  - Photo of sample
  - Any notes (difficult collection, patient issues)
  - Chain of custody (who handled sample)

- **Technology:** Barcode scanner, photo capture, sample tracking database
- **Estimated Effort:** 2 days

Step 9: Rider App - Delivery Management
- **Process:** Similar to phlebotomist but focused on sample delivery
- **Features:**
  - Assigned pickup points (addresses or collection centers)
  - Pickup task queue (where to collect samples)
  - Delivery destination (lab partner address)
  - Delivery deadline (must deliver before lab closes)
  - Temperature monitoring (for temperature-sensitive samples)
  - Delivery confirmation with photo
- **Workflow:**
  1. Rider logs in and sees pickup assignments
  2. Navigates to first pickup point
  3. Collects samples (verified against list)
  4. Takes photo of samples
  5. Updates status to "Picked Up"
  6. Navigates to lab delivery point
  7. Hands over samples to lab staff
  8. Gets signature/acknowledgement
  9. Takes photo of delivery
  10. Marks as "Delivered"
- **Technology:** Flutter app, GPS, temperature sensor integration (optional)
- **Estimated Effort:** 3 days

Step 10: Rider App - Route Optimization & Delivery Status
- **Process:** Optimize delivery routes and provide ETA updates
- **Features:**
  - Google Maps integration for optimal route
  - Multiple pickup/delivery points in single trip
  - Time-based delivery windows (must deliver between 2-3pm)
  - Proof of delivery (photo + signature)
  - Real-time delivery status push to customers
  - Issue reporting (sample damaged, wrong sample, etc.)
- **Technology:** Maps API, delivery optimization algorithm
- **Estimated Effort:** (Included in Step 9)

Step 11: UI Design - Phlebotomist & Rider Apps
- **Process:** Design professional, intuitive mobile interfaces
- **Design Considerations:**
  - Simple navigation for field staff (not tech-savvy)
  - Large buttons (easy to tap with gloves)
  - Offline capability (work even with poor connectivity)
  - Dark mode (easy on eyes in field)
  - Accessibility features (high contrast, large fonts)
  - Local language support (English/Arabic)
- **Design Deliverables:**
  - Figma/Sketch mockups
  - Design system (colors, typography, components)
  - Interaction flows
  - Accessibility audit

- **Technology:** Figma or Sketch
- **Estimated Effort:** 7 days

Step 12: Additional Module - Stock Management
- **Process:** Track consumables issued to phlebotomists
- **Features:**
  - Issue vials, syringes, gloves, cotton to each phlebotomist (per day/shift)
  - Track quantity used
  - Calculate waste/loss
  - Reorder alerts (low stock)
  - Supplier management (who provides consumables)
  - Cost tracking (calculate per-collection cost)
- **Workflow:**
  1. Admin issues consumables to phlebotomist (batch or daily)
  2. Phlebotomist receives and acknowledges
  3. Phlebotomist uses consumables during collections
  4. End-of-day stock return and balance reconciliation
  5. System calculates waste percentage
  6. Reports generated for inventory management
- **Technology:** Inventory management module, barcode tracking
- **Estimated Effort:** 12 days

Step 13: Testing & UAT - Phase 1.0
- **Process:** Comprehensive mobile app testing
- **Scope:**
  - Phlebotomist app: All features on iOS and Android
  - Rider app: All features on iOS and Android
  - GPS accuracy testing
  - Offline functionality
  - Payment terminal integration
  - Photo capture and upload
  - Battery consumption testing
  - Performance under low connectivity
- **Device Testing:** iPhone 12+, Android 10+, various screen sizes
- **Estimated Effort:** 10 days

SECTION 3: PHASE 1.2 - ENHANCED FEATURES (Weeks 21-24)

Process Flow: Customer Engagement & Operational Management

Step 1: Admin Dashboard - Appointment Rescheduling
- **Process:** Allow customers and admin to reschedule bookings
- **Features:**
  - Customer can reschedule via app (self-service)
  - Show available slots for rescheduling
  - Auto-suggest same phlebotomist (if available)
  - Reschedule fee policy (free within 24hrs, charged after)
  - Notification to phlebotomist of rescheduled time
  - Update invoice with new date
- **Constraints:**
  - Cannot reschedule within 2 hours of appointment

- Maximum 2 reschedules per booking (prevent abuse)
    - Must reschedule before sample collection
- **Technology:** Booking management system, calendar UI
- **Estimated Effort:** 2 days

Step 2: Admin Dashboard - Shift/Time Management
- **Process:** Manage phlebotomist shift schedules
- **Features:**
  - Define working hours (8am-5pm, flexible hours, etc.)
  - Set holidays (national holidays, phlebotomist leaves)
  - Manage shift rotations
  - Track overtime
  - Availability calendar (visual calendar showing available/unavailable
days)
  - Alert when too many tasks for available staff
  - Suggest hiring when understaffed
- **Workflow:**
  1. Admin defines base shift schedule
  2. Phlebotomists can request time off (approve/reject)
  3. System alerts when understaffed for specific time slot
  4. Admin can override and force assignments (with overtime flag)
  5. System calculates overtime compensation
- **Technology:** Shift scheduling module, calendar API
- **Estimated Effort:** 10 days

Step 3: Patient App - Organ-Based Test Information
- **Process:** Educate customers about tests and organs
- **Features:**
  - Click on organ in body diagram → shows related tests
  - Test details:
    - What it measures
    - Normal range
    - Why it's important
    - When to get tested
    - Cost
  - Symptom checker (customer reports symptoms → suggests relevant tests)
  - Body diagram (interactive human silhouette)
  - Health conditions (diabetes, heart disease, etc.) → associated tests
- **Data:** Pre-populated from medical reference database
- **Technology:** Interactive body diagram (D3.js or custom), content
database
- **Estimated Effort:** 8 days

Step 4: Patient App - Add Dependents/Family Members
- **Process:** Manage family member profiles under one account
- **Features:**
  - Add dependent (child, spouse, parent)
  - Relation type (spouse, child, parent, sibling)
  - Separate profile for each dependent (name, DOB, blood type, medical
history)
  - One-click booking for family member (select from dropdown)
  - Shared payment method (book for spouse using own card)
  - Family health dashboard (view all family reports together)
  - Set access permissions (who can see whose reports)

- **Use Case:** Parent books tests for children, wife books for husband
- **Technology:** Multi-user profile management, permission system
- **Estimated Effort:** 3 days

Step 5: Patient App - Rating & Feedback
- **Process:** Collect customer feedback on service quality
- **Features:**
  - Post-booking survey (after sample collection):
    - Phlebotomist rating (1-5 stars)
    - Cleanliness rating
    - Professionalism rating
    - On-time rating
    - Overall experience rating
    - Open comments/suggestions
  - Incentives for feedback (offer discount on next booking)
  - Phlebotomist performance dashboard (admin can see ratings)
  - Flag low ratings for admin follow-up
  - Publish reviews on app (anonymous)
- **Technology:** Survey/feedback module, sentiment analysis (optional)
- **Estimated Effort:** 3 days

Step 6: Patient App - WhatsApp & SMS Alerts
- **Process:** Notifications via WhatsApp and SMS
- **Triggers:**
  - Booking confirmation
  - Phlebotomist assigned
  - Phlebotomist ETA (5 mins away)
  - Sample collected
  - Report ready
  - Account balance low (for prepaid accounts)
  - New offers/promotions (opt-in)
- **Message Templates:**
  - Short, clear messages in English/Arabic
  - Include booking reference, link to track, support number
  - CTA buttons (Click to view report, etc.)
- **Technology:** WhatsApp Business API, SMS gateway (Twilio, etc.)
- **Estimated Effort:** 2 days

Step 7: Patient App - Phlebotomist ETA Notifications
- **Process:** Proactive notification when phlebotomist is arriving
- **Features:**
  - Push notification when phlebotomist leaves their previous location (30 mins away)
  - SMS with "Your phlebotomist is 15 mins away"
  - Live ETA on app (countdown timer)
  - Option to postpone arrival (reschedule to later same day)
  - Chat with phlebotomist ("Please wait, I'm running late", "Use side entrance", etc.)
- **Technology:** Location-based notifications, geofencing
- **Estimated Effort:** (Included in Phase 1.0 GPS tracking)

Step 8: Testing & UAT - Phase 1.2
- **Scope:**
  - Rescheduling functionality

- Shift management workflows
  - Organ-based test information accuracy
  - Family member management
  - Feedback collection and display
  - SMS/WhatsApp delivery (verify 3rd party integration)
  - ETA notifications accuracy
- **Estimated Effort:** 10 days

SECTION 4: PHASE 2.0 - REAL-TIME TRACKING & CRM (Weeks 25-28)

Process Flow: Advanced Operational Intelligence

Step 1: Admin Dashboard - Real-Time Phlebotomist Tracking
- **Process:** Live GPS tracking of all phlebotomists on map
- **Features:**
  - Google Map showing all online phlebotomists
  - Color-coded by status (available=green, busy=blue, offline=gray)
  - Click on phlebotomist → show:
    - Current location
    - Assigned tasks (today)
    - Performance metrics (rating, collections today)
    - Contact button (call/message)
  - Heatmap view (show busy areas)
  - Geofence alerts (phlebotomist left assigned zone)
  - Trip history (track where phlebotomist went during shift)
- **Analytics:**
  - Average distance per task
  - Time per task
  - Idle time
  - Utilization rate
- **Technology:** Google Maps API, real-time location streaming
- **Estimated Effort:** 7 days

Step 2: Admin Dashboard - Area Service Zone Setup
- **Process:** Define service zones for phlebotomists
- **Features:**
  - Draw zones on map (polygon tool)
  - Assign phlebotomists to zones
  - Set zone properties:
    - Name (North Zone, Downtown, etc.)
    - Opening hours
    - Max daily bookings (to prevent overload)
  - Route optimization per zone
  - Emergency overflow (assign to nearby zone if overloaded)
- **Use Case:**
  - Ensure phlebotomist can reach customer within promised time
  - Balance workload across zones
  - Optimize travel distance
- **Technology:** Mapping API (Google Maps), polygon drawing library
- **Estimated Effort:** 6 days

Step 3: Admin Dashboard - Rider Tracking Panel

- **Process:** Track sample deliveries in real-time
- **Features:**
  - Similar to phlebotomist tracking but for riders
  - Show delivery route (pickup → delivery)
  - Status updates (Picked Up → In Transit → Delivered)
  - Proof of delivery (photo uploaded)
  - Issue alerts (delay, temperature excursion, etc.)
  - Delivery performance metrics (on-time %, average delivery time)
- **Technology:** GPS tracking, temperature sensor data (IoT), alerts
- **Estimated Effort:** 7 days

Step 4: Admin Dashboard - Payout Management
- **Process:** Calculate and manage payments to vendors
- **Features:**
  - Phlebotomist payouts:
    - Per-collection commission (e.g., 50 AED per collection)
    - Bonus for ratings > 4.5 stars
    - Deductions (absent, poor feedback)
    - Monthly payout statement
    - Payment method (bank transfer, cash, wallet)
  - Rider payouts:
    - Per-delivery commission (e.g., 30 AED per delivery)
    - Bonus for on-time delivery
    - Deductions (damaged samples, delays)
  - Lab partner settlements:
    - Tasheel share vs Lab share (e.g., 70/30)
    - Invoice generation
    - Payment schedule
    - Reconciliation
  - Generate payout reports
  - Batch payment processing
- **Technology:** Financial module, payment gateway integration
- **Estimated Effort:** 9 days

Step 5: Admin Dashboard - Coupon Code System
- **Process:** Create and manage promotional offers
- **Features:**
  - Create coupons (percentage discount, fixed amount, free shipping)
  - Define validity:
    - Date range
    - Max usage count
    - Min booking value
    - Specific test/lab eligibility
  - Track usage (how many customers used)
  - Analytics (conversion rate, avg revenue per coupon)
  - Automatically apply to eligible customers
  - Send coupon via email/SMS/in-app
- **Use Cases:**
  - First-time user discount (10%)
  - Loyalty reward (free delivery on 5th booking)
  - Seasonal offer (Ramadan discount)
  - Lab partner promotion (3 bookings get 1 free)
- **Technology:** Promotion engine, redemption tracking
- **Estimated Effort:** 5 days

Step 6: Admin Dashboard - Billing & Invoicing
- **Process:** Enhanced billing capabilities
- **Features:**
  - Auto-generate invoices for:
    - Customers (after sample collection)
    - Lab partners (settled monthly)
    - Phlebotomists/Riders (payout statements)
  - invoice templates - pre defined In case of changes, it has be changed from the developer side at additional cost
  - Multiple tax support (VAT, GST if applicable in Bahrain)
  - Late payment reminders
  - Payment plan support (installments)
  - Tax compliance reporting
  - Archive all invoices (5-year retention)
- **Technology:** Billing/invoicing system, PDF generation
- **Estimated Effort:** 7 days

Step 7: Admin Dashboard - CRM Automation (SMS/WhatsApp Flows)
- **Process:** Automated customer engagement campaigns
- **Features:**
  - Segment customers:
    - New customers (first-time)
    - Inactive (no booking in 30 days)
    - High-value (total spent > threshold)
    - By test type (diabetes patients, pregnancy tests, etc.)
  - Auto-send campaigns:
    - Welcome message to new customers
    - "It's been 30 days, check your health" to inactive
    - "Re-order same tests" to repeat customers
    - "Related tests to your recent booking" upsell
  - A/B testing (test 2 message versions)
  - Track engagement (open rate, click rate)
  - Personalization (use customer name, past tests)
- **Technology:** Marketing automation platform (Salesforce, HubSpot, or custom)
- **Estimated Effort:** 7 days

Step 8: Patient App - Smart Reports (Compare Last 5 Reports)
- **Process:** View and compare multiple past reports
- **Features:**
  - Timeline view (reports chronologically)
  - Compare feature (select 2-5 reports side-by-side)
  - Show trends (is result improving/worsening?)
  - Highlight abnormal values (red for low/high)
  - Reference range comparison
  - Export comparison as PDF
  - Notes (patient can add notes to report: "Started medication", "After diet change")
- **Data Visualization:**
  - Line graphs (trend over time)
  - Tables (values comparison)
  - Color coding (green/normal, yellow/warning, red/critical)

- **Technology:** Data visualization library (Chart.js, D3.js), PDF export
- **Estimated Effort:** 10 days

Step 9: Patient App - In-App Chat/Call with Phlebotomist
- **Process:** Direct communication between patient and phlebotomist
- **Features:**
  - Available only after booking confirmed
  - Text chat (in-app messaging)
  - Voice call (phone integration)
  - Pre-written templates:
    - "Back entrance, call me when you arrive"
    - "Running late, can we reschedule?"
  - Chat history (last 10 messages)
  - Scheduled reminder (remind phlebotomist 1 hour before)
- **Technology:** WebSocket for chat, Twilio
- **Estimated Effort:** 4 days

Step 10: Patient App - Smart Health Insights (Basic)
- **Process:** AI-powered health recommendations based on reports
- **Features:**
  - Analysis of patient's most recent report
  - Flag abnormal results
  - Suggest lifestyle changes (if borderline):
    - High cholesterol → "Reduce fatty foods, increase fiber"
    - High blood sugar → "Reduce sugar, exercise 30 mins daily"
    - Low iron → "Eat red meat, leafy greens, or iron supplements"
  - Drug interactions (if patient added medications in profile)
  - When to see a doctor (based on severity of abnormal results)
  - Recommended next tests (based on history and abnormal results)
  - Integration with lifestyle apps (fitness, diet tracking - future)
- **Data Source:** Medical knowledge base (curated guidelines)
- **Technology:** Rule-based system or ML model, medical knowledge base
- **Estimated Effort:** 7 days

Step 11: Mobile Apps - In-App Navigation for Delivery
- **Process:** Integrated route navigation for riders
- **Features:**
  - One-tap navigate to customer address (opens Google Maps)
  - Select preferred navigation app (Google Maps, Waze)
  - Turn-by-turn voice guidance
  - Show alternative routes
  - Estimated arrival time
  - Add stops (multiple pickups/deliveries)
- **Technology:** Maps API integration
- **Estimated Effort:** 6 days

Step 12: Mobile Apps - Real-Time Status Updates
- **Process:** Instant sync of booking status between all systems
- **Features:**
  - Phlebotomist marks "Collected" → instantly visible in:
    - Customer app ("Sample collected at 2:15pm")
    - Admin dashboard (status updates)
    - Lab portal (sample added to queue)

- Rider app (sample ready for pickup)
    - Rider marks "Delivered" → instantly visible:
      - Lab system (sample received)
      - Customer app ("Sample delivered to lab")
      - Admin dashboard
    - Latency target: <5 seconds for status update propagation
- **Technology:** WebSocket real-time updates, message queue (RabbitMQ, Kafka)
- **Estimated Effort:** 5 days

Step 13: Outsourced Lab Portal - Billing & Work Order Management
- **Process:** Lab partner manages accepted bookings and generates invoices
- **Features:**
  - **Work Order Management:**
    - View all assigned tests
    - Filter by status (Received → Testing → Report Ready)
    - Print work list
    - Mark completion stages
    - Add notes/issues
  - **Billing Reconciliation:**
    - Monthly invoice from Tasheel to lab
    - Itemize each test (test name, quantity, rate, amount)
    - Show Tasheel commission deduction
    - Net payment to lab
    - Payment confirmation/receipt
  - **Settlement:**
    - Review invoice accuracy
    - Approve/dispute items
    - Payment schedule (weekly, monthly)
    - Payment method (bank transfer, check)
- **Technology:** Lab management system integration
- **Estimated Effort:** 5 days + 6 days work order = 11 days combined

Step 14: Lab Portal - Automated Alerts & Rejection Notifications
- **Process:** Proactive alerts for process exceptions
- **Features:**
  - Delay alerts:
    - "Sample received 2 days ago, still testing" → flag for follow-up
    - "Expected TAT was 24hrs, now 48hrs" → notify customer of delay
  - Rejection alerts:
    - "Sample hemolyzed (damaged), recollection required"
    - "Insufficient sample, need re-draw"
    - Auto-notify customer via SMS/email
    - Auto-suggest quick re-booking
  - Quality alerts:
    - "Result out of expected range, needs verification"
    - "Equipment malfunction, results delayed"
  - Auto-escalation (alert admin if delay > 48hrs)
- **Technology:** Alert engine, automated notification system
- **Estimated Effort:** 4 days

Step 15: Testing & UAT - Phase 2.0
- **Scope:**

- Real-time tracking accuracy
  - Zone setup and assignment
  - Payout calculations accuracy
  - Billing/invoicing generation
  - CRM automation triggers
  - Smart report comparisons
  - Health insights accuracy
  - Integration with all systems
- **Estimated Effort:** 15 days

SECTION 5: PHASE 3.0 - INTELLIGENT ASSIGNMENT (Weeks 29-36)

Process Flow: AI-Powered Resource Optimization

Step 1: Admin Dashboard - Smart Assignment (Auto-Allocate Phlebotomists)
- **Process:** assigns optimal phlebotomist to each booking
- **Algorithm Logic:**
  1. **Distance Optimization:**
     - Calculate distance from phlebotomist's current location to customer address
     - Prefer closest available phlebotomist
  2. **Load Balancing:**
     - Consider phlebotomist's current task count
     - Prefer less-loaded phlebotomist (if within reasonable distance)
  4. **Availability:**
     - Check phlebotomist's shift hours, days off, breaks
  5. **Service Zone:**
     - Ensure assigned phlebotomist covers customer's area
  6. **Repeat Customer:**
     - Preference for same phlebotomist (if available) for continuity
  7. **Time Window:**
     - Ensure phlebotomist can reach customer within promised window

  - Learn from past assignments (what worked, what didn't)
  - Improve over time based on customer satisfaction ratings
  - Predict no-shows and pre-emptively assign backup
- **Admin Override:**
  - Admin can manually override auto-assignment if needed
  - System tracks overrides for improvement
- **Estimated Effort:** 30 days (most complex feature)

Step 2: Rider App - Route Optimization
- **Process:** Optimize delivery routes for riders
- **Features:**
  - Input: Multiple pickup and delivery locations
  - Algorithm calculates optimal route (visiting all in order)
  - Consider:
    - Distance minimization
    - Traffic patterns (real-time)
    - Delivery time windows (deliver between 2-3pm)
    - Vehicle capacity (can't overload)

- Show estimated completion time
  - Allow manual adjustment (if driver prefers different order)
  - Track actual vs predicted time (for learning)
- **Use Case:**
  - Rider picks up samples from 3 collection centers and delivers to lab
  - Optimal order minimizes travel time and fuel
  - Automatic if 100+ deliveries/day, manual if small volume
- **Technology:** Traveling Salesman Problem (TSP) solver, Google Maps API, traffic data
- **Estimated Effort:** 10 days

Step 3: Rider & Phlebotomist App - Auto-Task Assignment
- **Process:** Automatically assign tasks based on real-time availability
- **Features:**
  - New booking comes in
  - System finds closest available phlebotomist (from smart assignment algorithm)
  - Automatically sends task notification to phlebotomist
  - Phlebotomist can accept/decline within 30 seconds
  - If declined, automatically reassigns to next best candidate
  - If no one accepts in 2 minutes, escalate to admin
- **Real-Time:**
  - As phlebotomist completes a task, system immediately checks for new assignments
  - Auto-assign next task if available
- **Efficiency Gain:**
  - Reduce manual assignment time (from 5 mins to 30 secs)
  - Increase utilization (less idle time between tasks)
  - Improve TAT (faster assignment = sooner collection)
- **Technology:** Real-time event processing, task queue, push notifications
- **Estimated Effort:** 10 days

Step 4: Admin Dashboard - Real-Time Reallocation
- **Process:** Dynamically reallocate resources based on demand
- **Scenarios:**
  1. **Spike in bookings:** One area gets 10x normal volume
     - Auto-reassign idle phlebotomists from quiet areas to busy areas
     - Notify reassigned phlebotomists of new location
     - Offer incentive (bonus) for reallocation
  2. **Phlebotomist Unavailability:** Phlebotomist goes offline unexpectedly
     - System finds replacement for their pending tasks - **future**
     - Customer notified: "Different phlebotomist" (or offer reschedule)
  3. **Quality Issues:** Phlebotomist with high no-show rate
     - System gradually removes bookings from their queue
     - Reassign to reliable phlebotomists
  4. **Emergency:** Multiple samples need urgent delivery
     - System prioritizes and reallocates riders
- **Constraints:**
  - Minimize customer inconvenience
  - Respect phlebotomist working hours and zones
  - Maintain service level agreements (SLA)
- **Technology:** Real-time decision engine, constraint solver

- **Estimated Effort:** 10 days

Step 5: Testing & UAT - Phase 3.0
- **Scope:**
  - Smart assignment algorithm accuracy
  - Route optimization correctness
  - Auto-task assignment workflow
  - Reallocation scenarios
  - Edge cases (no available resources, emergency)
  - Performance (algorithm speed with 1000+ assignments)
  - ML model accuracy (if using ML)
- **Estimated Effort:** 10 days

SECTION 6: SMART HEALTH REPORT GENERATION (Advanced Feature - Phase 2+)

Process Flow: Interactive Health Insights

Overview:
Tasheel converts standard lab reports into interactive "Smart Reports" with organ system visualization, color-coded results, health insights, and next steps.

Step 1: Report Reception from Lab Partner

Input:
- Lab partner uploads test results (CSV/manually via portal)
- Data format: Sample ID, Test Code, Result Value, Reference Range, Unit
- Example:
  - Hemoglobin: 13.5 g/dL (normal range: 13.5-17.5 for males)
  - Blood Glucose: 145 mg/dL (normal: 70-100 fasting)
  - Total Cholesterol: 220 mg/dL (normal: <200)

Storage:
- Store in database linked to customer and booking
- Archive for 5+ years (compliance requirement)

Step 2: Report Conversion Algorithm

Process:
1. **Identify organs/systems affected:**
   - Map test codes to organ systems
   - Example: "Hemoglobin" → Hematology (Blood) System

2. **Color-code results:**
   - **Green (Normal):** Result within normal range
   - **Yellow (Borderline/Warning):** Slightly outside normal, monitor
   - **Red (Critical/High Risk):** Significantly abnormal, requires attention

3. **Organ system visualization:**
   - Create interactive body diagram with organs

- Each organ colored based on tests:
        - Heart (Red): High cholesterol, irregular heartbeat
        - Liver (Yellow): Elevated liver enzymes
        - Kidney (Green): Normal kidney function
      - Click organ → shows related tests and values

4. **Health insights:**
      - Generate text recommendations based on results
      - Example: "Your cholesterol is elevated. Reduce saturated fats,
increase fiber, and exercise 30 mins daily."

5. **Trend analysis (if comparing past reports):**
      - Show if value is improving/worsening over time
      - Suggest next test date (e.g., "Re-test in 3 months")

Step 3: Smart Report UI Components

Component 1: Test Results Summary
- Display all tests in table format
- Columns: Test Name, Result, Unit, Reference Range, Status
(Green/Yellow/Red)
- Sort by: Organ System, Abnormality Level, Alphabetical

Component 2: Interactive Body Diagram
- Human silhouette showing all body systems
- Color-coded organs based on test results
- Click organ → expand to show:
  - Tests affecting this organ
  - Individual test results
  - Organ-specific health tips
- Organs included:
  - Brain & Nervous System
  - Heart & Cardiovascular
  - Lungs & Respiratory
  - Liver & Digestive
  - Kidney & Urinary
  - Blood & Hematology
  - Thyroid & Endocrine
  - Immune System
  - Musculoskeletal

Component 3: Health Insights & Recommendations
- Auto-generated recommendations based on abnormal results
- Categories:
  - **Lifestyle Changes:**
    - Diet: "Increase vegetables, reduce salt"
    - Exercise: "Walk 30 mins daily"
    - Sleep: "Aim for 7-8 hours"
  - **Dietary Guidance:**
    - Foods to Increase: "Iron-rich foods (spinach, chicken)"
    - Foods to Avoid: "Avoid sugar, refined carbs"
    - Supplements: "Consider iron supplement"
  - **Doctor Consultation:**
    - When to see doctor: "If you have symptoms, consult cardiologist"

- Tests to follow up: "Re-test glucose in 3 months"
    - **Medication Alerts:**
      - If patient added medications in profile, show interactions
      - Flag if test results indicate medication adjustment needed

Component 4: Trend & Comparison
- Line graph showing trend (if previous reports available)
- X-axis: Date of test
- Y-axis: Result value
- Mark normal range as shaded zone
- Show if trend is improving (downward arrow) or worsening (upward arrow)

Component 5: Action Items
- Next steps based on results
- Suggested tests to follow up (if abnormal)
- Doctor appointment recommendation
- Option to schedule teleconsultation directly from report

Step 4: Teleconsultation Integration

Process:
- Patient views smart report
- If abnormal results or wants to discuss:
  - Click "Consult Doctor" button
  - Choose from available doctors (based on specialization)
  - Video/audio call with doctor
  - Doctor can view report during consultation
  - Prescription or follow-up plan documented

Features:
- Schedule appointment (select time slot)
- Secure video call (Zoom, Jitsi integration)
- Chat history
- Prescription documentation
- Attach files (images, documents)

Step 5: Smart Report Storage & Access

Patient Access:
- View smart report in app
- Download as PDF (includes all visualizations)
- Share with family members (with permission)
- Share with doctor (secure link, read-only)
- Email report to self
- Print-friendly version

Data Structure:
```
SmartReport {
  reportId: UUID
  patientId: UUID
  bookingId: UUID
  testResults: [
    {
```

```
      testCode: "HB",
      testName: "Hemoglobin",
      result: 13.5,
      unit: "g/dL",
      referenceRange: "13.5-17.5",
      status: "normal", // normal, warning, critical
      organSystem: "Hematology"
    }
  ],
  organSystemStatus: {
    "Hematology": "normal",
    "Cardiovascular": "warning",
    "Kidney": "normal"
  },
  recommendations: [
    {
      category: "Diet",
      text: "Increase iron-rich foods..."
    }
  ],
  trends: [
    {
      testCode: "HB",
      historicalValues: [12.5, 13.0, 13.5], // Past 3 reports
      direction: "improving" // improving, stable, worsening
    }
  ],
  generatedAt: timestamp,
  viewedAt: timestamp,
  lastUpdated: timestamp
}
```

Step 6: Organ System Mapping

Comprehensive Mapping of Common Tests to Organs:

Test	Result Example	Reference Range	Organ System	Status	Recommendation
Hemoglobin	13.5 g/dL	13.5-17.5	Blood/Hematology	Green	Normal
Total Cholesterol	220 mg/dL	<200	Heart/Cardiovascular	Red	Reduce saturated fats, exercise
Blood Glucose	145 mg/dL	70-100 (fasting)	Pancreas/Endocrine	Red	Reduce sugar, check for diabetes
Triglycerides	150 mg/dL	<150	Heart/Cardiovascular	Yellow	Monitor, improve diet
LDL Cholesterol	140 mg/dL	<100	Heart/Cardiovascular	Red	High risk, consult cardiologist
HDL Cholesterol	35 mg/dL	>40	Heart/Cardiovascular	Red	Increase exercise
Creatinine	1.5 mg/dL	0.7-1.3	Kidney/Urinary	Yellow	Monitor kidney function

BUN (Blood Urea)	28 mg/dL	7-20	Kidney/Urinary	Red	Possible dehydration or kidney issue
AST (Liver Enzyme)	45 U/L	10-40	Liver/Digestive	Yellow	Reduce alcohol, fatty foods
ALT (Liver Enzyme)	55 U/L	10-40	Liver/Digestive	Red	Consult hepatologist, avoid alcohol
TSH (Thyroid)	5.2 mIU/L	0.4-4.0	Thyroid/Endocrine	Yellow	May indicate hypothyroidism
Vitamin D	18 ng/mL	>30	Bones/Musculoskeletal	Red	Supplement Vitamin D, sunlight exposure
Iron	45 µg/dL	60-170	Blood/Hematology	Red	Eat red meat, leafy greens
PSA (Prostate)	8.5 ng/mL	<4	Prostate	Red	Consult urologist
Calcium	8.5 mg/dL	8.5-10.2	Bones/Musculoskeletal	Green	Normal
Phosphorus	3.8 mg/dL	2.5-4.5	Bones/Musculoskeletal	Green	Normal
WBC (White Blood Cell)	12,000 cells/µL	4,500-11,000	Immune System	Yellow	May indicate infection
Platelet Count	180,000/µL	150,000-400,000	Blood/Hematology	Green	Normal clotting function

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SECTION 7: CRITICAL PROCESS POINTS & COMPLIANCE

Data Security & Privacy

1. **Encryption:**
   - All data in transit: TLS 1.2+
   - All data at rest: AES-256 encryption
   - Patient health data: Double encryption layer

2. **Access Control:**
   - Role-based access (patient sees only their data)
   - Audit logging of all data access
   - Multi-factor authentication for staff

3. **Compliance:**
   - Bahrain Personal Data Protection Law (PDPL)
   - Healthcare data localization (data stored in Bahrain)
   - 5-year data retention minimum
   - Right to deletion/access per regulations

Quality Assurance

1. **Sample Integrity:**
   - Chain of custody tracking (who handled sample)
   - Temperature monitoring for sensitive samples
   - Barcode validation at each stage
   - Photo evidence of proper handling

2. **Report Validation:**
   - Lab QA checks before uploading

- Tasheel system validates format
    - Outlier detection (automated check for unrealistic values)
    - Manual review by medical professional (optional, for critical results)

3. **SLA Monitoring:**
    - Expected TAT per test (e.g., 24-48 hours)
    - Alert if exceeding TAT
    - Compensation if SLA breached
    - Track compliance rate per lab partner

Financial Controls

1. **Payment Reconciliation:**
    - Daily reconciliation of cash vs system records
    - Weekly payment to phlebotomists/riders
    - Monthly settlement with lab partners
    - Audit trail of all transactions

2. **Commission Structure:**
    - Phlebotomist: 50-80 AED per collection (by expertise level)
    - Bonus: +10 AED if rating > 4.5 stars
    - Rider: 30 AED per delivery + fuel allowance
    - Lab Partner: 70% of test fee (Tasheel takes 30%)

3. **Chargeback Prevention:**
    - Capture authorization code for all online payments
    - 24-hour cooling off period for refunds
    - Document reason for refund
    - Track refund patterns per customer

SECTION 8: RISK MITIGATION & RECOMMENDATIONS

Potential Risks & Mitigations

Risk	Impact	Mitigation
3rd Party Integration Delays	SMS/Payment/WhatsApp may delay QL	Start integration early, have fallback (offline payment, email)
Lab Partner Quality Issues	Poor report quality affects customer trust	Implement QA checks, regular audits, SLA penalties
Phlebotomist Shortage	Cannot fulfill bookings, revenue loss	Aggressive recruitment, incentive programs, outsourcing to trained technicians
Data Breach	Customer trust loss, regulatory fine	Encryption, regular security audits, cyber insurance, incident response plan
GPS Tracking Battery Drain	Phlebotomist battery dies mid-day	Optimize GPS accuracy (5-min updates vs continuous), provide chargers
Offline Functionality Issues	System doesn't work without internet	Queue-based sync, local data storage, auto-retry when online
Smart Report Accuracy	Incorrect health recommendations	Validate against medical guidelines, expert review, frequent updates

| **Payment Gateway Failures** | Customers cannot pay | Multiple payment gateway providers, offline payment option |
| **Lab Partner Data Loss** | Results lost, customer dissatisfaction | Backup systems, redundant storage, disaster recovery plan |

Suggested Enhancements (Phase 4+)

1. **Wearable Integration:**
   - Sync data from fitness trackers, smartwatches
   - Show correlation with test results
   - Predict health issues based on wearable trends

2. **Pharmacy Integration:**
   - Prescription generation from doctor consultation
   - Direct order to pharmacy
   - Home delivery of medications

3. **Insurance Integration:**
   - Check insurance coverage for tests
   - Auto-billing to insurance
   - Claim submission automation

4. **Predictive Health Analytics:**
   - Machine learning model to predict health risks
   - Proactive recommendations (e.g., "Based on your age and family history, get diabetes screening")
   - Risk score calculation

5. **Subscription Plans:**
   - Monthly subscription for health monitoring (unlimited tests)
   - Quarterly health check-up packages
   - Family subscription (4+ members)

6. **Cold Chain Logistics (Temperature-Controlled Delivery):**
   - IoT sensors in delivery boxes
   - Real-time temperature monitoring
   - Alert if sample deteriorates
   - Data logged for compliance

7. **Home Nursing Services:**
   - Post-test care or IV drips at home
   - Care coordination with tests

SECTION 9: TECHNOLOGY STACK SUMMARY

Layer	Technology	Purpose
Frontend - Web	React.js (Node.js backend)	Admin dashboard, lab portal, vendor portal
Frontend - Mobile	Flutter	iOS/Android apps (Patient, Phlebotomist, Rider)

Backend	Node.js + Express.js	APIs, business logic, integrations
Database	Microsoft SQL Server	Primary data storage, shared schema
Cache	Redis	Session management, real-time data
Authentication	JWT/OAuth2	Secure login, token-based auth
APIs	RESTful API design	Third-party integrations (SMS, Payment, Maps, etc.)
Real-Time	WebSocket	Live tracking, status updates, notifications
Message Queue	RabbitMQ/Kafka	Asynchronous processing, event streaming
File Storage	Google Cloud Storage / AWS S3	Reports, photos, documents
Monitoring	ELK Stack (Elasticsearch, Logstash, Kibana)	Logs, monitoring, alerting
Deployment	Docker / Kubernetes	Containerization, orchestration, scaling
CI/CD	GitHub Actions / GitLab CI	Automated testing, deployment

---

PHASE-WISE SUMMARY TABLE

Phase	Duration	Key Features	Effort (Days)	Payment
QL 1.0	4 weeks	Admin Dashboard (basic), Patient App (browsing)	73	$4,950
QL 2.0	6 weeks	Lab Portal (acknowledgment, results upload)	14	$4,950
QL 3.0	8 weeks	Lab Management, Walk-in, Billing	34	$6,300
Phase 1.0	20 weeks	Phlebotomist & Rider Apps, GPS Tracking, Stock Mgmt	108	$9,000
Phase 1.2	24 weeks	Rescheduling, Shift Mgmt, Multi-language, Feedback	40	$4,500
Phase 2.0	28 weeks	Real-time Tracking, Payout Mgmt, CRM, Smart Reports	125	$6,300
Phase 3.0	36 weeks	Smart Assignment, Route Optimization, Reallocation	60	$3,600
Post-Delivery	Ongoing	Teleconsultation, Payroll, Wearables (Future)	—	$4,000/year
TOTAL	36 weeks	Full Platform Deployment	454 hours	$53,000

CONCLUSION

This detailed process note provides a comprehensive roadmap for Tasheel HealthConnect's development. The platform integrates:

✓ **Multi-vendor Lab Aggregation** (Talabat for Labs model)
✓ **Home Collection Logistics** (Phlebotomist + Rider networks)
✓ **Real-Time Tracking** (GPS, status updates)

✓ **Smart Health Reports** (Interactive visualizations, organ mapping, recommendations)
✓ **Financial Management** (Billing, payouts, settlements)
✓ **Operational Intelligence** (Dashboards, analytics, CRM automation)
✓ **Quality & Compliance** (Data security, SLA monitoring, regulatory adherence)

Next Steps:
1. Conduct detailed "HODO Anatomy" sessions to refine requirements
2. Finalize wireframes and UI designs
3. Set up development environment and CI/CD pipeline
4. Begin QL 1.0 development immediately
5. Establish 3rd party service integrations (payment, SMS, maps)
6. Prepare testing and UAT protocols
7. Plan go-live and training logistics

Document Control:
- **Version:** 1.0
- **Date:** January 3, 2026
- **Status:** Final
- **Next Review:** Upon completion of QL 3.0 (February 16, 2026)

TASHEEL HEALTHCONNECT - COMPREHENSIVE DEVELOPER PROCESS NOTE
Aggregator Lab Platform: Complete Build Guide with Workflows, Flowcharts & Specifications

Document Version: 3.0 - COMPLETE BUILD PACKAGE
Date: January 6, 2026
Status: Ready for Development Initiation
Prepared for: HODO Development Team
Target Platform: iOS, Android (Flutter) + Web (React/Node.js)

📋 EXECUTIVE SUMMARY

Tasheel HealthConnect is a **comprehensive aggregator platform for lab services** (similar to Talabat/Zomato for healthcare) that enables:

✅ **Customers** to discover, compare, and book lab tests from multiple labs
✅ **Phlebotomists** to collect samples with barcode verification
✅ **Riders** to collect samples from multiple collection points and deliver to center
✅ **Centers** to sort samples by lab and dispatch
✅ **Labs** to receive samples and upload results via API or manual portal
✅ **Smart Reports** with interactive organ-wise visualization and recommendations

This document covers the **complete end-to-end workflow, database design, API specifications, and wireframes** needed to build this platform.

🎯 PLATFORM CONCEPT & POSITIONING

What is Tasheel HealthConnect?

Type: Aggregator Platform (B2C + B2B)
Model: Similar to Talabat (food delivery) but for Laboratory Tests
Revenue: Commission from labs (primary), advertising (secondary)
Geographic Focus: Bahrain (Phase 1), expandable to GCC

Key Value Propositions

For Customers	For Labs	For Phlebotomists
Compare test prices across labs	Increased customer reach	Consistent work assignments
Book home collection	Real-time sample tracking	Digital work tracking

Track collection in real-time	Verified sample chain of custody	Performance-based earnings
Smart, interactive health reports	Pre-registered samples via API	Professional equipment provision
Symptoms → Test recommendations	Reduced manual data entry	Safety & compliance focus

---

📊 COMPLETE END-TO-END WORKFLOW

```
CUSTOMER JOURNEY:
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━

Step 1: DISCOVERY & BOOKING
Customer → App Home
  ↓
Search Test (e.g., "Complete Blood Count")
  ↓
Browse Labs (filter by price, rating, TAT, distance)
  ↓
Select Lab & Book Test
  ↓
Pay (Card/Cash/Bank Transfer - Insurance in Phase 2)
  ↓
Confirmation SMS/Email/WhatsApp

Step 2: COLLECTION
Phlebotomist Assigned (matched by location + skills)
  ↓
Phlebotomist navigates to customer
  ↓
Collects sample with barcode scanning
  ↓
Digital signature (phlebotomist)
  ↓
Marks "Ready for Handover"

Step 3: SAMPLE HANDOVER & VERIFICATION
Rider Notified (samples ready)
  ↓
Rider Scans All Samples (barcode verification: 8/8 match)
  ↓
Missing sample detection (if 7/8 → alert immediately)
  ↓
Both Sign Digital Signature (chain of custody)
  ↓
GPS logged, temperature recorded, photos captured

Step 4: TRANSPORT TO CENTER
Rider Transports Samples
  ↓
```

```
GPS tracking every 30 seconds
  ↓
Real-time alerts on violations
  ↓
Optimized route delivery

Step 5: CENTER RECEIPT & SORTING
Center Staff Receive & Verify
  ↓
Scan all barcodes again (verification)
  ↓
Visual inspection & temperature check
  ↓
Sort samples by lab (3 different labs in example)
  ↓
Staff sign-off

Step 6: LAB DISPATCH
Center Portal Entry:
    ├── INTEGRATED LABS (American Hospital):
    │      Auto-sync via API ✅
    │      Samples pre-registered in lab's LIS
    │      Same Tasheel barcode used
    │      NO manual entry, NO reprinting
    │
    └── NON-INTEGRATED LABS (Zaki, Path Lab):
           Manual portal entry ❌
           Barcode reprinting (vendor format)
           New rider dispatch with new barcodes
           Lab manually registers upon receipt

Step 7: LAB TESTING & RESULT ENTRY
Lab Receives Samples
  ↓
Process & Test Samples
  ↓
Results Entered into Lab's LIS
  ↓
Upload Results to Tasheel (API or manual PDF)

Step 8: SMART REPORT GENERATION
Results Received by Tasheel
  ↓
Data Validation (range checks, critical values)
  ↓
Organ-wise Mapping (which body system affected)
  ↓
Color Coding (Green=Normal, Yellow=Caution, Red=Alert)
  ↓
AI Analysis Engine:
    ├── What this means for your health
    ├── Related conditions to watch
    ├── Personalized recommendations (diet, exercise, lifestyle)
    ├── Food recommendations (what to eat/avoid)
```

```
        ├─ Supplement suggestions (if deficiencies detected)
        ├─ Severity assessment (mild/moderate/severe)
        ├─ Comparison with previous 5 reports (trends)
        └─ Timeline: when to retest, follow-up actions

Step 9: CUSTOMER REPORT ACCESS
Smart Report Sent to Customer
  ↓
Interactive Body Diagram (clickable organs)
    ├─ Blood System (CBC results)
    ├─ Cardiovascular System (Lipid panel)
    ├─ Endocrine System (Thyroid)
    ├─ Digestive/Metabolic (Glucose, Liver)
    └─ Immune System (WBC count)
  ↓
Organ Detail Cards (when clicked):
    ├─ What this test measures
    ├─ Your result + reference range
    ├─ Color-coded status
    ├─ Health implications
    ├─ Related conditions
    └─ Recommendations
  ↓
Tele-consultation Option (optional, Phase 2):
    ├─ Chat with doctor
    ├─ Video consultation booking
    └─ Prescription upload

PHLEBOTOMIST WORKFLOW:
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━

Online Status
  ↓
Receive Collection Task Notification
  ↓
Accept Task
  ↓
Navigate to Patient (GPS-guided)
  ↓
Arrive & Verify Patient (ID + CPR + DOB)
  ↓
Check Allergies & Special Notes
  ↓
Collect Sample (vein selection, needle gauge, tube type)
  ↓
Scan Barcode (sample verification)
  ↓
Check Sample Integrity (no hemolysis, proper mix)
  ↓
Digital Signature Capture (phlebotomist)
  ↓
Mark "Ready for Handover"
  ↓
```

Rider Notified Automatically

RIDER WORKFLOW:
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━

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Online Status
  ↓
Receive "Samples Ready" Notification
  ↓
Navigate to Phlebotomist Location
  ↓
Scan Each Sample Barcode (8/8 verification)
  ↓
Missing Sample Detection (if any):
   └─ Immediate alert → phlebotomist collects now
        OR mark not collected → reschedule
  ↓
Both Sign Digital Signature
  ↓
Transport to Center:
   ├─ GPS tracked every 30 seconds
   │
   └─ Real-time alerts on violations
  ↓
Center Staff Verify Receipt
  ↓
Dispatch to Labs (based on routing):
   ├─ Integrated Lab: Auto API sync
   └─ Non-Integrated Lab: Manual entry + reprinting

CENTER STAFF WORKFLOW:
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━

━━━━━━━━━━━━━━━━━━━━━━━━━━━━━

Receive Samples from Rider
  ↓
Scan All Barcodes (verification)
  ↓
Visual Inspection & Quality Check
  ↓
Record Temperature
  ↓
Sort Samples by Lab:
   ├─ Lab 1: 3 samples
   ├─ Lab 2: 3 samples
   └─ Lab 3: 2 samples
  ↓
For Integrated Labs:
   └─ System Auto-syncs via API (no manual work)
  ↓
For Non-Integrated Labs:
   ├─ Log into vendor portal

```
        ├── Manual data entry
        ├── Print new vendor barcodes
        ├── Remove old barcodes
        ├── Affix new barcodes
        └── Assign rider for dispatch

LAB STAFF WORKFLOW:
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━

Integrated Labs (API):
    ├── Samples pre-registered in LIS
    └── Ready to test immediately

Non-Integrated Labs (Manual):
    ├── Receive samples from rider
    ├── Manually register in LIS
    └── Begin testing

All Labs:
   ↓
Process Samples
   ↓
Enter Results in LIS
   ↓
QA Verification
   ↓
Upload to Tasheel (API or PDF)
   ↓
Results appear in Smart Report pipeline
```

🔄 DETAILED PROCESS FLOWCHARTS

Flowchart 1: CUSTOMER BOOKING FLOW (50-Second Checkout)

```
START (Customer Opens App)
    ↓
[Search Test or Browse Popular] ──────→ "Complete Blood Count"
    ↓
[Filter & Compare Labs]
├── Price: 150-180 AED
├── Rating: 4.5-5.0 stars
├── TAT: 18-24 hours
├── Distance: 2.5 km
├── Home collection: Yes
└── Insurance: Accepted
    ↓
[Select Lab] ──────→ "Advanced Diagnostics"
    ↓
[Select Collection Type]
```

```
├─ Home Collection ← SELECTED
│   ├─ Date: 02-JAN-2026
│   └─ Time: 2:00-4:00 PM
└─ Walk-in at Lab
        ↓
[Enter Collection Address]
├─ Full Address
├─ Building Type
├─ Special Instructions: "Gate locked, call on arrival"
└─ Preferred Arm: "Left arm"
        ↓
[Patient Profile]
├─ Myself (Primary)
├─ Family Member (Wife, Son)
└─ Add New Family Member
        ↓
[Review Order]
├─ Test: CBC (160 AED)
├─ Lab: Advanced Diagnostics
├─ Collection: Home
├─ Address: Villa 145, Manama
├─ Date/Time: 02-JAN, 2-4 PM
├─ Subtotal: 160 AED
├─ Discount (FIRST50): -50 AED
├─ TAX: 0 AED
└─ TOTAL: 110 AED
        ↓
[Payment]
├─ Payment Method: Visa Card
├─ Amount: 110 AED
├─ Status: Processing...
└─ Response: APPROVED ✅
        ↓
[Confirmation]
├─ SMS Sent: "Booking confirmed ORD-2025-001234"
├─ Email Sent: Invoice + Receipt
├─ WhatsApp: Status update
├─ In-App Notification: Ready to track
└─ Phlebotomist assignment: Within 15 min
        ↓
[Payment Reconciliation]
├─ Transaction ID: TXN-2025-9876543
├─ Amount Charged: 110 AED
├─ Commission to Tasheel: 15 AED (15% of 110)
├─ Amount to Lab: 80 AED (B2B cost)
├─ Admin Fee: 15 AED
└─ Status: COMPLETED ✅
        ↓
END (Order Placed Successfully)
```

Flowchart 2: SAMPLE HANDOVER & VERIFICATION WORKFLOW

```
```

```
START (Rider Receives "Samples Ready" Notification)
    ↓
[Rider Accepts Task]
├── Location: Phlebotomist clinic
├── Samples: 8 ready
└── ETA: 15 minutes
    ↓
[Rider Navigates to Phlebotomist]
├── GPS Route: Active
├── Turn-by-turn: Navigation
└── ETA: 15 minutes
    ↓
[Rider Arrives at Phlebotomist]
├── GPS Location: Verified
├── Phlebotomist: Present & Ready
└── Samples: On the table
    ↓
[Rider Initiates Barcode Scanning]
├── Expected Samples: 8
│   ├── HB-001 (Hemoglobin)
│   ├── LP-002 (Lipid Profile)
│   ├── UA-003 (Uric Acid)
│   ├── TS-004 (Thyroid Screen)
│   ├── FB-005 (Fasting Glucose)
│   ├── CBC-006 (Complete Blood Count)
│   ├── KF-007 (Kidney Function)
│   └── LF-008 (Liver Function)
└── Start Scanning: [CLICK]
    ↓
[BARCODE SCANNING LOOP - SAMPLE 1]
├── Camera Open: ML Kit barcode detection
├── Scan: HB-001
├── Expected: HB-001
├── Result: ✅ MATCH CONFIRMED
├── Sample 1/8: Verified ✅
├── Audio: Success beep
└── Auto-advance to Sample 2
    ↓
[REPEAT FOR SAMPLES 2-7]
├── All match expected ✅
├── Sample count: 8/8
└── Status: 100% VERIFICATION COMPLETE
    ↓
[CRITICAL DECISION POINT - Missing Sample Check]
├── Expected: 8 samples
├── Scanned: 8 samples
└── Result: ✅ ALL MATCHED
    ↓
[IF ANY SAMPLE MISSING]
├── Expected: 8, Scanned: 7 (LF-008 missing)
├── Alert: 🚨 SAMPLE COUNT MISMATCH
├── Notification: Sent to admin + customer + phlebotomist
└── Rider Options:
    ├── [Option 1] Wait: Phlebotomist collects now
```

```
        ├─ [Option 2] Continue: Mark not collected, reschedule
        └─ [Option 3] Document: Another rider has it
          ↓
[DIGITAL SIGNATURE - Phlebotomist Signs First]
├─ Name: Fatima Ahmed
├─ Location: Marina, Dubai (GPS verified)
├─ Timestamp: 14:50:45 UTC
├─ Method: Signature drawing pad OR Fingerprint
├─ Signature Image: Captured & stored
└─ Status: ✅ SIGNED

          ↓
[DIGITAL SIGNATURE - Rider Signs]
├─ Name: Mohammed Hassan
├─ Location: Marina, Dubai (GPS verified)
├─ Timestamp: 14:50:50 UTC
├─ Method: Signature drawing pad
├─ Signature Image: Captured & stored
├─ Confirmation: "I accept 8 samples from Fatima Ahmed"
│   ├─ All barcodes matched ✓
│   ├─ All samples in good condition ✓
│   ├─ Temperature maintained ✓
│   ├─ GPS location verified ✓
│   └─ Chain of custody established ✓
└─ Status: ✅ SIGNED & ACCEPTED

          ↓
[CHAIN OF CUSTODY RECORD CREATED]
├─ Transaction ID: HOT-20260105-001
├─ Handover ID: UUID generated
├─ Phlebotomist ID: PHB-123
├─ Rider ID: RID-456
├─ Samples: 8/8 all verified ✅
├─ Barcodes Matched: 8/8 ✅
├─ Temperature: 25°C (Safe: 18-28°C) ✅
├─ Humidity: 45% (Acceptable) ✅
├─ Signatures: Both captured ✅
├─ GPS Data: Recorded ✅
├─ Photos: Evidence attached ✅
├─ Audit Trail: Complete ✅
└─ Status: HANDOVER COMPLETE ✅

          ↓
[TRANSPORT TO CENTER]
├─ Samples in Transit: 8
├─ Next Stop: Collection Center (Downtown)
├─ Distance: 8.3 km
├─ ETA: 25 minutes
├─ GPS Tracking: Active (every 30 seconds)
├─ Temperature Monitoring: Active (every 5 minutes)
├─ Real-time Alerts: Enabled
└─ Status: IN TRANSIT

          ↓
END (Ready for Center Receipt & Verification)
```

Flowchart 3: SMART REPORT GENERATION PIPELINE

```
START (Results Received from Lab)
    ↓
[Lab Upload Results]
├── Integration Type: INTEGRATED (API) OR NON-INTEGRATED (Manual PDF)
├── Format: JSON (API) or PDF (Manual)
├── Sample: CBC - Complete Blood Count
└── Results: 6 parameters (WBC, RBC, Hb, Hct, MCV, Platelets)
    ↓
[DATA INGESTION & VALIDATION]
├── Parser: Extract all result values
├── Range Check: Is each value within normal range?
│   ├── WBC: 7.2 (Normal: 4.5-11.0) ✅
│   ├── RBC: 4.9 (Normal: 4.5-5.9) ✅
│   ├── Hemoglobin: 14.5 (Normal: 13.5-17.5) ✅
│   ├── Hematocrit: 43.2 (Normal: 41-53) ✅
│   ├── MCV: 88 (Normal: 80-100) ✅
│   └── Platelets: 250 (Normal: 150-400) ✅
├── Critical Values Check: Any panic values?
│   └── None detected ✅
├── Data Quality Check: All fields present?
│   └── Yes ✅
└── Status: VALIDATION PASSED ✅
    ↓
[IF NON-INTEGRATED LAB (PDF UPLOAD)]
├── PDF Received: Lab uploads report PDF
├── Bot/AI Agent: RPA (UiPath) or OCR (Google Vision)
├── Extraction Process:
│   ├── Identify result fields from PDF
│   ├── Extract numeric values
│   ├── Map to standard parameters
│   ├── Validate extracted data
│   └── Store in database
└── Status: EXTRACTION COMPLETE
    ↓
[ORGAN-WISE MAPPING]
├── Test: Complete Blood Count (CBC)
├── Organ Systems Affected:
│   ├── Blood System: DIRECTLY (RBC, WBC, Platelets)
│   ├── Cardiovascular System: INDIRECTLY (oxygen-carrying capacity)
│   ├── Immune System: DIRECTLY (WBC count)
│   └── Respiratory System: INDIRECTLY (oxygen capacity from Hemoglobin)
└── Primary System: BLOOD SYSTEM
    ↓
[COLOR CODING LOGIC]
├── Rule Engine:
│   ├── If value within reference range → GREEN ✅
│   ├── If value ≥90% to <110% of normal → YELLOW ⚠
│   └── If value <90% or >110% of normal → RED 🔴
├── Applied Results:
│   ├── WBC: 7.2 → GREEN (within range)
│   ├── RBC: 4.9 → GREEN (within range)
│   ├── Hemoglobin: 14.5 → GREEN (within range)
```

```
│     ├─ Hematocrit: 43.2 → GREEN (within range)
│     ├─ MCV: 88 → GREEN (within range)
│     └─ Platelets: 250 → GREEN (within range)
└─ Overall Status: ALL GREEN ✅
        ↓
[HEALTH INSIGHTS GENERATION]
├─ AI Analysis Engine:
│     ├─ What this test measures?
│     │   └─ "Complete Blood Count measures three types of blood cells:
│     │      white cells (immune), red cells (oxygen), platelets (clotting)"
│     │
│     ├─ What do results mean?
│     │   └─ "All parameters are normal. Your blood count indicates:
│     │      - Healthy immune system (WBC normal)
│     │      - Good oxygen-carrying capacity (RBC & Hb normal)
│     │      - Normal clotting ability (Platelets normal)"
│     │
│     ├─ Health implications?
│     │   ├─ NO signs of anemia
│     │   ├─ NO active infection
│     │   ├─ NO blood disorders
│     │   └─ NO clotting issues
│     │
│     └─ Severity Assessment: NORMAL (No issues detected)
│       ↓
[PERSONALIZED RECOMMENDATIONS]
├─ Age-Based: Patient is 32 years old (Adult)
├─ Gender-Based: Male
├─ History-Based: Compare with previous 5 reports
│     └─ Trend: Stable and improving ✅
│
├─ NUTRITION Recommendations:
│     ├─ Foods to Include:
│     │   ├─ Red meat, poultry, fish (Iron for RBC)
│     │   ├─ Beans, lentils, spinach (Plant-based iron)
│     │   ├─ Citrus fruits (Vitamin C aids iron absorption)
│     │   └─ Nuts, seeds (Healthy fats)
│     │
│     └─ Foods to Avoid:
│         ├─ Excess caffeine (interferes with iron absorption)
│         ├─ High-fat processed foods
│         └─ Excess sugar
│
├─ EXERCISE Recommendations:
│     ├─ Cardio: 30 min, 5 days/week (improves RBC production)
│     ├─ Strength Training: 2 days/week
│     └─ Activity: Walking, jogging, swimming
│
├─ LIFESTYLE Recommendations:
│     ├─ Sleep: 7-9 hours/night (aids immune cell production)
│     ├─ Stress Management: Meditation or yoga (stress affects WBC)
│     ├─ Hydration: Minimum 8 glasses/day (helps oxygen transport)
│     └─ Avoid: Smoking, excessive alcohol
│
```

```
├── SUPPLEMENT Suggestions:
│   ├── Iron Supplement: Not needed (levels normal)
│   ├── B12 Supplement: Not needed (levels normal)
│   └── Vitamin C: Optional for iron absorption
│
└── Status: RECOMMENDATIONS GENERATED
        ↓
[TREND ANALYSIS]
├── Previous 5 Tests:
│   ├── Test 5 (30 days ago): WBC 7.1, RBC 4.8, Hb 14.3
│   ├── Test 4 (60 days ago): WBC 7.0, RBC 4.8, Hb 14.2
│   ├── Test 3 (90 days ago): WBC 6.9, RBC 4.7, Hb 14.1
│   ├── Test 2 (120 days ago): WBC 6.8, RBC 4.6, Hb 14.0
│   └── Test 1 (150 days ago): WBC 6.7, RBC 4.5, Hb 13.9
│
├── Trend Analysis:
│   ├── WBC: ↗ INCREASING (6.7 → 7.2) - Within range, good
│   ├── RBC: ↗ INCREASING (4.5 → 4.9) - Improving
│   └── Hemoglobin: ↗ INCREASING (13.9 → 14.5) - Improving
│
├── Chart Generated: Line graph showing 6-month trend
└── Status: TREND ANALYSIS COMPLETE
        ↓
[INTERACTIVE BODY DIAGRAM CREATION]
├── SVG Body Diagram Generated:
│   ├── Blood System: Status NORMAL (Green) ✅
│   │   └── Click → Detailed card with CBC results
│   │
│   ├── Cardiovascular System: Status NORMAL (Green) ✅
│   │   └── Related to Lipid Panel results (if available)
│   │
│   ├── Immune System: Status NORMAL (Green) ✅
│   │   └── WBC count indicates healthy immunity
│   │
│   ├── Respiratory System: Status NORMAL (Green) ✅
│   │   └── Oxygen-carrying capacity from Hemoglobin
│   │
│   └── [Other Organs] Based on other test results
│
├── Interactive Features:
│   ├── Clickable Organs: Tap to see detail cards
│   ├── Color Legend: Green=Normal, Yellow=Caution, Red=Alert
│   ├── Zoom: Magnify specific organs
│   └── Tap Info Icon: Learn about each organ system
│
└── Status: BODY DIAGRAM CREATED
        ↓
[REPORT GENERATION]
├── Smart Report Components:
│   ├── Header
│   │   ├── Patient Name: Ahmed Hassan Al-Dosari
│   │   ├── Test: Complete Blood Count (CBC)
│   │   ├── Lab: Advanced Diagnostics
│   │   ├── Date: 02-JAN-2026
```

```
│   │         └─ TAT: 18 hours
│   │
│   ├─ Interactive Body Diagram (Clickable)
│   │
│   ├─ Test Results Table
│   │   ├─ Component | Your Value | Range | Status
│   │   ├─ WBC | 7.2 KL | 4.5-11 | ✅ OK
│   │   └─ ... [6 parameters]
│   │
│   ├─ Health Insights
│   │   └─ "Healthy blood profile. All cells normal..."
│   │
│   ├─ Recommendations
│   │   ├─ Nutrition (what to eat/avoid)
│   │   ├─ Exercise (30 min cardio, 5x/week)
│   │   ├─ Lifestyle (sleep, stress, hydration)
│   │   └─ Supplements (if needed)
│   │
│   ├─ Trend Analysis
│   │   ├─ 6-month trend chart
│   │   └─ "Stable and improving trend"
│   │
│   ├─ Comparison with Previous Reports
│   │   └─ "vs 08-DEC-2025: Slight increase in WBC"
│   │
│   └─ Next Steps
│       ├─ Next CBC: In 1 year or if symptoms
│       └─ When to See Doctor: If symptoms develop
│
├─ Format Generated:
│   ├─ Interactive HTML (In-app)
│   ├─ PDF (Downloadable)
│   └─ Shareable Link (Email/WhatsApp)
│
└─ Status: REPORT GENERATED ✅
        ↓
[SEND TO CUSTOMER]
├─ Notification: "Your CBC report is ready!"
├─ Delivery Channels:
│   ├─ In-App: Push notification + tab in app
│   ├─ Email: Full report link + summary
│   ├─ SMS: "Report ready - view in app"
│   └─ WhatsApp: Quick link to report
│
├─ Customer Actions:
│   ├─ View Full Report
│   ├─ Download PDF
│   ├─ Share with Family
│   ├─ Share with Doctor
│   ├─ Ask Doctor (Chat)
│   ├─ Book Consultation (if abnormal)
│   └─ Compare with Previous Reports
│
└─ Status: DELIVERED TO CUSTOMER ✅
```

```
        ↓
END (Smart Report Complete & Accessible)
```

```
);
```
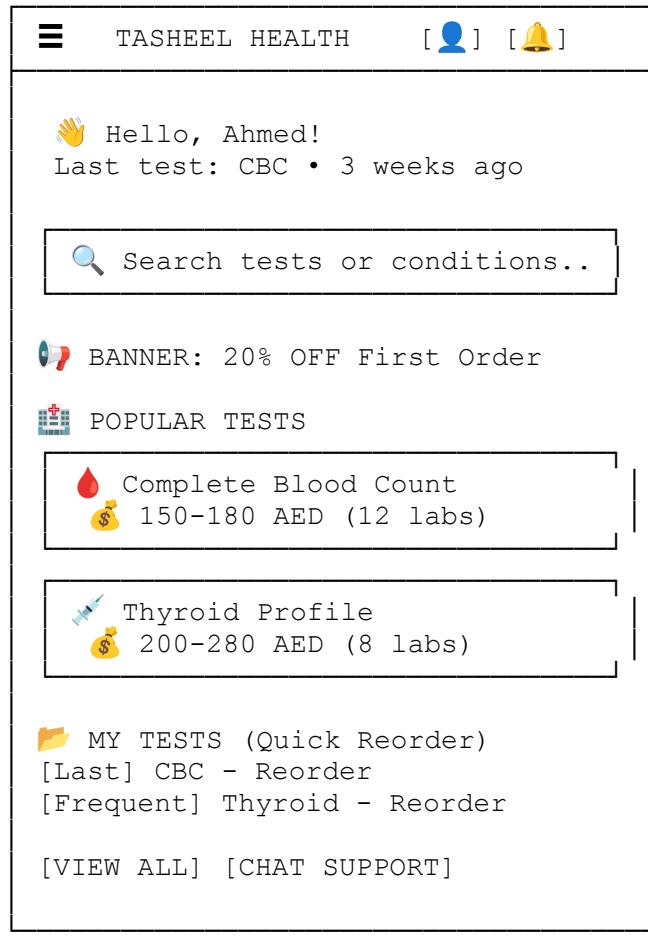
📱 WIREFRAMES & UI MOCKUPS

1. Customer App Home Screen

```
┌──────────────────────────────────────┐
│  ☰    TASHEEL HEALTH    [👤] [🔔]    │
│ ┌──────────────────────────────────┐ │
│ │                                  │ │
│ │ 👋 Hello, Ahmed!                 │ │
│ │ Last test: CBC • 3 weeks ago     │ │
│ │                                  │ │
│ │ ┌──────────────────────────────┐ │ │
│ │ │ 🔍 Search tests or conditions.. │ │
│ │ └──────────────────────────────┘ │ │
│ │                                  │ │
│ │ 📣 BANNER: 20% OFF First Order   │ │
│ │                                  │ │
│ │ 🏥 POPULAR TESTS                 │ │
│ │ ┌────────────────────────────┐ │ │ │
│ │ │ 🩸 Complete Blood Count    │ │ │ │
│ │ │ 💰 150-180 AED (12 labs)   │ │ │ │
│ │ └────────────────────────────┘ │ │ │
│ │                                │ │ │
│ │ ┌────────────────────────────┐ │ │ │
│ │ │ 💉 Thyroid Profile         │ │ │ │
│ │ │ 💰 200-280 AED (8 labs)    │ │ │ │
│ │ └────────────────────────────┘ │ │ │
│ │                                  │ │
│ │ 📂 MY TESTS (Quick Reorder)      │ │
│ │ [Last] CBC - Reorder             │
│ │ [Frequent] Thyroid - Reorder     │
│ │                                  │
│ │ [VIEW ALL] [CHAT SUPPORT]        │
│ │                                  │
└──────────────────────────────────────┘
```

2. Lab Comparison Screen

```
┌──────────────────────────────────────┐
│ ┌──────────────────────────────────┐ │
│ │ ◄  Complete Blood Count          │ │
│ │ Filter [▼] Sort [▼]              │ │
```

```
┌─────────────────────────────────┐
│                                 │
│  🏥  CENTRAL LAB - DOWNTOWN      │
│  💰  150 AED                     │
│  ⭐  4.8/5.0 (1,250 reviews)     │
│  ⏱   24-hour TAT                 │
│  📍  2.5 km away                 │
│  ✅  Insurance: Accepted         │
│                                 │
│  [SELECT] [DETAILS]             │
│                                 │
├─────────────────────────────────┤
│                                 │
│  🏥  ADVANCED DIAGNOSTICS        │
│  💰  160 AED (CHEAPER BY 10 AED!)│
│  ⭐  4.9/5.0 (890 reviews) ⭐ BEST│
│  ⏱   18-hour TAT ⭐ FASTEST      │
│  📍  3.1 km away                 │
│  ✅  Insurance: Accepted         │
│                                 │
│  [SELECT] [DETAILS]             │
│                                 │
├─────────────────────────────────┤
│   ...More labs below...          │
└─────────────────────────────────┘
```

3. Booking Confirmation Screen

```
┌─────────────────────────────────┐
│  ✅  BOOKING CONFIRMED           │
│                                 │
│  Order #: ORD-2025-001234       │
│  Date: 02-JAN-2026              │
│  Time: 2:00 PM - 4:00 PM        │
│                                 │
│  📍 COLLECTION ADDRESS           │
│  Villa 145, Al Manara District  │
│  Manama 428, Bahrain            │
│                                 │
│  🏥 LAB: Advanced Diagnostics    │
│  📋 TEST: Complete Blood Count   │
│  💰 TOTAL: 110 AED (Paid ✅)     │
│                                 │
│  ┌───────────────────────────┐  │
│  │ 👤  PHLEBOTOMIST ASSIGNED  │  │
│  │ Fatima Al-Rashid ⭐ 4.8/5.0│  │
│  │ ETA: 8 minutes (2:00 PM)  │  │
│  │ [TRACK] [CALL] [MESSAGE]  │  │
│  └───────────────────────────┘  │
│                                 │
│  ✅  SMS Sent                    │
│  ✅  Email Sent                  │
```

```
┌─────────────────────────────────────┐
│  ✅  Phlebotomist Notified          │
│                                     │
│   [TRACK REAL-TIME] [SHARE]         │
│                                     │
└─────────────────────────────────────┘
```

4. Live Tracking Screen

```
┌─────────────────────────────────────┐
│  ORDER: ORD-2025-001234             │
│  Status: Phlebotomist En Route ✓    │
├─────────────────────────────────────┤
│                                     │
│   MAP: [GPS Map showing location]   │
│   • Your Home: Villa 145            │
│   • Phlebotomist: 2 km away         │
│   • Route: Blue line                │
│   • ETA: 8 minutes (2:00 PM)        │
│                                     │
│   👤  PHLEBOTOMIST                  │
│   Fatima Al-Rashid                  │
│   Current Location: Approaching     │
│   Rating: 4.8/5.0                   │
│   [📞 CALL] [💬 MESSAGE]            │
│                                     │
│   🕐  TIMELINE                      │
│   ✅ 10:30 AM - Booking Confirmed   │
│   ✅ 10:31 AM - Payment Completed   │
│   ✅ 10:45 AM - Phlebo Assigned     │
│   ⏳ 10:53 AM - En Route (8 min left)│
│   🔴 Collection (Pending)           │
│   🔴 Report Ready (Pending)         │
│                                     │
│   [SHARE LOCATION] [CALL SUPPORT]   │
│                                     │
└─────────────────────────────────────┘
```

5. Smart Report - Interactive Body Diagram

```
┌─────────────────────────────────────┐
│  SMART HEALTH REPORT - CBC          │
│  Date: 02-JAN-2026                  │
├─────────────────────────────────────┤
│                                     │
│   INTERACTIVE BODY SYSTEM           │
│                                     │
│        🧠  BRAIN [Grey]             │
│        (Not tested in this panel)   │
│                                     │
│     ❤️  HEART [Green] ✅            │
```

```
        (Cardiovascular System)        |
                                        |
     🫁  LUNGS [Green] ✅              |
     (Respiratory System)              |
                                        |
     🩸  BLOOD [Green] ✅ ← YOU CLICKED |
     (Blood System)                    |
     • WBC: Normal                     |
     • RBC: Normal                     |
     • Platelets: Normal               |
                                        |
     🦴  IMMUNE [Green] ✅             |
     (Immune System)                   |
                                        |
     🍽️  DIGESTIVE [Yellow] ⚠         |
     (May need attention)              |
                                        |
   [TAP ANY ORGAN FOR DETAILS]         |
                                        |
```

6. Smart Report - Blood System Details

```
 ◀ BLOOD SYSTEM - DETAILED ANALYSIS

 TEST: Complete Blood Count (CBC)      |
 Date: 02-JAN-2026                     |
 Status: 🟢 HEALTHY PROFILE (100%)    |
                                        |
 KEY FINDINGS:                         |
                                        |
 🔵  WHITE BLOOD CELLS (WBC)          |
   Your Value: 7.2 KL                  |
   Normal Range: 4.5-11.0 ✅          |
   Meaning: Immune system healthy,     |
   no active infection detected.       |
                                        |
 🔴  RED BLOOD CELLS (RBC)            |
   Your Value: 4.9 ML                  |
   Normal Range: 4.5-5.9 ✅           |
   Meaning: Good oxygen-carrying       |
   capacity, not anemic.               |
                                        |
 🟡  PLATELETS                        |
   Your Value: 250 KL                  |
   Normal Range: 150-400 ✅           |
   Meaning: Blood clotting ability     |
   is normal.                          |
                                        |
 ✅  WHAT THIS MEANS:                  |
```

```
     • No signs of anemia
     • No active infection
     • Normal clotting ability
     • Healthy immune system

     💊  RECOMMENDATIONS:
     • Continue current lifestyle
     • Maintain iron-rich diet
     • Exercise 30 min daily
     • Next test: In 1 year

     [ASK DOCTOR] [DOWNLOAD PDF]
```

🎯 CRITICAL SUCCESS FACTORS

Quality Assurance Checkpoints

Before launch, verify:

✅ **Barcode Scanning**
- [ ] CODE128 format 99%+ success rate
- [ ] Handles poor lighting conditions
- [ ] <2 second scan time

✅ **Missing Sample Detection**
- [ ] 100% detection rate
- [ ] Alerts sent to all stakeholders within 30 seconds
- [ ] Comprehensive documentation

✅ **Smart Reports**
- [ ] All results extracted correctly from lab PDFs
- [ ] Color coding matches clinical standards
- [ ] Recommendations personalized to age/gender
- [ ] Interactive body diagram responsive on mobile

✅ **API Integration**
- [ ] Labs' LIS systems connected & tested
- [ ] Pre-registered samples verified at labs
- [ ] Sample barcodes match between systems

✅ **Performance**
- [ ] App loads in <2 seconds
- [ ] Dashboard refreshes every 30 seconds without lag
- [ ] GPS tracking works in background

✅ **Security**
- [ ] SSL/TLS encryption for all data
- [ ] Patient data PII encrypted at rest

- [ ] GDPR/Privacy compliance verified

TASHEEL HEALTHCONNECT - DETAILED SPECIFICATIONS GUIDE
Complete Data Fields, UI Layouts, and Developer Specifications

Document Date: January 3, 2026
Version: 1.0
Status: Final - Ready for Developer Meetings
Prepared for: Tasheel Healthcare W.L.L. & HODO Development Team

---

SECTION 1: ADMIN DASHBOARD (OPERATIONS CONTROL CENTER)

Purpose: Central command center for all Tasheel operations, real-time monitoring, analytics, and system configuration.

Access Levels:
- Admin (Full access to all features)
- Operations Manager (Bookings, assignments, phlebotomist tracking)
- Support Team (Booking status, customer support)
- Finance Manager (Billing, payouts, reports)
- Lab Manager (Lab operations, test catalog)

1.1 HOME SCREEN / DASHBOARD OVERVIEW

Key Performance Indicators (KPIs) Widget

Field Name	Data Type	Source	Purpose	Notes
Total Bookings (Today)	Integer	Booking DB	Real-time count of bookings	🟢 Confirmed
Total Revenue (Today)	Currency (BHD)	Payment DB	Sum of successful payments	🟡 Need currency selection
Active Phlebotomists	Integer	User Status	Count of online phlebotomists	🟢 Confirmed
Active Riders	Integer	User Status	Count of online riders	🟢 Confirmed
Completed Collections	Integer	Sample Status	Count completed today	🟢 Confirmed
Pending Deliveries	Integer	Delivery Status	Count pending lab delivery	🟢 Confirmed
Average Response Time	Time (minutes)	Task Log	Avg from booking to assignment	Need to define acceptance time window
Customer Satisfaction Score	Percentage (0-100)	Ratings Table	Avg of phlebotomist ratings	🟡 Partial - scale not defined

| **System Uptime** | Percentage | Server Logs | Platform availability %
| 🟠 ****: Add SLA monitoring |

Dashboard Layout

```
┌─ TASHEEL HEALTHCONNECT - OPERATIONS DASHBOARD

│                                                    [Settings]
[Logout] │
─────────────────────────────────────────────────────────────────
──────┐
      │

      │    📊  TODAY'S METRICS

           ┌──────────────┬──────────────┬──────────────┬──────────────┐

           │  🟢  125 BOOKINGS│ 5,250 BHD   │  🟢  18 PHLEBO  │  🟢  8 RIDERS  │

           │    Revenue    │   Complete    │    Online     │    Online     │

           └──────────────┴──────────────┴──────────────┴──────────────┘


      │    📍  ACTIVE OPERATIONS

           ┌──────────────────────────┬──────────────────────────┐

           │ LIVE BOOKING QUEUE        │ PHLEBOTOMIST TRACKING     │

           │ • Order #3421 - 5min ago │ • Phlebo 001 - 15% wait   │

           │ • Order #3422 - 3min ago │ • Phlebo 002 - 2% wait    │

           │ • Order #3423 - 1min ago │ • Phlebo 003 - 8% wait    │

           │ [View Queue] (Assigned)  │ [View All] (18 total)     │

           └──────────────────────────┴──────────────────────────┘


      │    📈  REVENUE TRACKER              🚚  DELIVERY STATUS

           ├─ Direct Collections: 3,200 BHD    ├─ In Transit: 45

           ├─ Lab Partnerships: 1,950 BHD      ├─ Delivered: 78

           ├─ Insurance: 100 BHD               ├─ Pending: 2 (alerts)

           └─ Refunds: -0 BHD                  └─ Failed: 0

      │
```

```
  │
  │      [📋 Reports] [📊 Analytics] [⚙ Settings] [👥 Users] [💰 Payments]
  │
  │
  │_____
  │
  └_____┘
```

Dashboard Refresh Rate
- **KPI Widgets:** Every 30 seconds (auto-refresh)
- **Booking Queue:** Real-time (WebSocket)
- **Phlebotomist Tracking:** Every 10 seconds (GPS update)
- **Manual Refresh:** Button provided

1.2 BOOKING MANAGEMENT MODULE

1.2.1 Booking Status Dashboard

Booking List View

Column	Data Type	Format	Sorting	Filtering
Booking ID	String	ORD-2025-001234	✓ Ascending/Descending	✓ Search
Patient Name	String	First + Last	✓ A-Z	✓ Contains
Test Type	String	"Complete Blood Count"	✓	✓ Multi-select
Booking Status	Enum	[Pending/Confirmed/Assigned/Collected/Delivered/Completed/Cancelled]	✓	✓ Filter
Booking Time	DateTime	DD/MM/YYYY HH:MM	✓ Recent First	✓ Date Range
Collection Time	DateTime	DD/MM/YYYY HH:MM	✓	✓ Date Range
Assigned Phlebotomist	String	"Phlebo Name + ID"	✓	✓ Dropdown
Collection Location	String	Address	✓	✓ Zone-based
Payment Status	Enum	[Pending/Partial/Completed/Failed]	✓	✓ Filter
Amount	Currency	150.00 BHD	✓ High-Low	✓ Range
Actions	Buttons	[View] [Edit] [Reassign] [Cancel]	-	-

 FIELDS to be Add to DB and UI):
- Customer Phone Number (for quick contact)
- Payment Method (Online/Cash/Card)
- Special Requests (difficult vein, allergies, etc.)
- Lab Partner Assigned (which lab will process)
- Confidence Score (phlebotomist suitability: 1-100%)
- Priority Level (Normal/Urgent/Walk-in)

🟡 **CLARIFICATION NEEDED:**
- Should admins be able to modify test selection after booking?

- What's the cancellation policy and penalties?
- Can booking time be changed after assignment?

1.2.2 Booking Detail View (Expanded Record)

```
BOOKING DETAILS
================================================================

Booking Information
┌────────────────────────────────────────────────────────────┐
│  Booking ID:        ORD-2025-001234                         │
│  Status:            🟡 ASSIGNED (Phlebo En Route - 8 min ETA)│
│  Created At:        02-JAN-2026 10:30 AM                     │
│  Priority:          NORMAL                                   │
│  Source:            Mobile App (iOS)                         │
└────────────────────────────────────────────────────────────┘

Patient Information
┌────────────────────────────────────────────────────────────┐
│  Patient Name:      AHMED HASSAN AL-DOSARI                   │
│  Patient ID:        PAT-2025-005678                          │
│  Age/DOB:           32 / 15-MAR-1993                         │
│  Gender:            Male                                     │
│  CPR/ID:            312345678901                             │
│  Phone:             +973-33123456                            │
│  Email:             ahmed@example.com                        │
│  Nationality:       Bahraini                                │
│  Previous Tests:    8 (Last: 3 weeks ago)                   │
│  Known Allergies:   Latex, Iodine                           │
│  Current Meds:      Metformin, Lisinopril                   │
│  Special Notes:     Difficult vein (left arm preferred)     │
└────────────────────────────────────────────────────────────┘

Test Information
┌────────────────────────────────────────────────────────────┐
│  Test 1:            Complete Blood Count (CBC)              │
│    • Sample Type:   EDTA Tube                               │
│    • Volume:        3 mL                                    │
│    • Fasting:       No                                      │
│    • Lab Partner:   Central Lab (Downtown Branch)          │
│    • Price (B2B):   80 BHD | Price (Customer): 150 BHD     │
│    • TAT:           24 hours                                │
│                                                            │
│  Test 2:            Thyroid Profile (TSH, Free T4)         │
│    • Sample Type:   SST (Serum)                            │
│    • Volume:        5 mL                                    │
│    • Fasting:       No                                      │
│    • Lab Partner:   Advanced Diagnostics Lab              │
│    • Price (B2B):   120 BHD | Price (Customer): 250 BHD    │
│    • TAT:           24 hours                                │
└────────────────────────────────────────────────────────────┘
```

```
  [+ Add More Tests] [Edit Tests]
```

Collection Address

```
 Address Type:       Home
 Full Address:       Villa 145, Al Manara District,
                     Manama 428, Kingdom of Bahrain
 Building/Apt:       Villa 145
 Building Type:      Villa
 Floor/Unit:         -
 Geolocation:        26.1551° N, 50.5540° E
 Distance from Ops: 8.5 km (Est. 18 min drive)
 Zone Assignment:    Zone 3 - East Manama
 Collection Instructions: "Gate is locked. Call on arrival"
 Images: [Door Photo] [House Number]
```

Phlebotomist Assignment

```
 Assigned Phlebo:    Fatima Al-Rashid (PHLEBO-045)
 Assignment Time:    02-JAN-2026 10:45 AM (15 min ago)
 ETA:                02-JAN-2026 10:53 AM (8 min remaining)
 Current Location:   Approaching (GPS: 26.1540° N, 50.5530° E)
 Assignment Score:   94% (Best match for location + skills)
 Confidence:         HIGH (Similar tests completed: 120)
 Rating:             4.8/5.0 (Based on 250 collections)
 [Map View] [GPS Track] [Call Phlebo] [Reassign]
```

Payment Information

```
 Sub Total:          400 BHD (2 tests)
 Discount:           -50 BHD (First time customer promo)
 Coupon Code:        FIRST50 (Applied)
 Taxes:              0 BHD (Exempt)
 Total Amount:       350 BHD
 Payment Method:     Online Payment (Visa Card)
 Payment Status:     ✓ COMPLETED (02-JAN-2026 10:31 AM)
 Transaction ID:     TXN-2025-9876543
 Refund Status:      None
 [Refund] [Print Invoice]
```

Collection Status & Timeline

```
 Step 1: ✓ Booking Confirmed (10:30 AM)
 Step 2: ✓ Payment Completed (10:31 AM)
 Step 3: ✓ Phlebo Assigned (10:45 AM) → ETA: 10:53 AM
 Step 4: ⏳ Collection In Progress...
 Step 5: ⭕ Sample to Lab (Pending)
 Step 6: ⭕ Lab Processing (Pending)
 Step 7: ⭕ Report Generated (Pending)
 Step 8: ⭕ Report Delivered (Pending)
```

```
└─────────────────────────────────────────────┘
```

Actions Available
[✓ Approve] [✗ Cancel] [🔁 Reschedule] [➜ Reassign Phlebo] [📞 Contact
Patient]
[🗺 Map View] [📊 Analytics] [⬇ Download PDF] [📧 Send Report Link]
```

---

### 1.2.3 Bulk Booking Actions

| Action | Description | Validation | Post-Action |
|:---|:---|:---|:---|
| **Bulk Approve** | Select multiple pending bookings | ✓ All tests available | Send confirmation SMS to all |
| **Bulk Assign** | Auto-assign phlebotomists | ✓ Location match + availability | Notify assigned phlebos |
| **Bulk Cancel** | Cancel selected bookings | ✓ No collections in progress | Refund + notify customers |
| **Bulk Reschedule** | Move to new date/time | ✓ New time available + phlebo free | Send new booking confirmation |
| **Export to CSV** | Download booking list | ✓ Date range selected | Generate Excel file |

🔴 **Points to considers**:
- Bulk SMS sending (direct message to all selected customers)
- Batch invoice generation (send invoices to multiple customers)
- Priority reordering (move urgent bookings to top of queue)
- Ability to Position Vendors in the booking page at first view
afterwards, the Customer can sort by Rating, Price, TAT etc.
- Affordable and Best should be highlighted.

## 1.3 PHLEBOTOMIST MANAGEMENT MODULE

### 1.3.1 Phlebotomist Master Database

| Field Name | Data Type | Required | Format | Validation | Notes |
|:---|:---|:---|:---|:---|:---|
| **Phlebotomist ID** | String | ✓ | PHLEBO-XXXX | Auto-generated | Unique identifier |
| **Full Name** | String | ✓ | "First Last" | Min 2 words | 🟢 Confirmed |
| **Phone Number** | String | ✓ | +973-XXXXX | Valid Bahrain # | 🟢 Confirmed |
| **Email** | String | ✓ | email@domain.com | Valid email | 🟡 Is email mandatory- Yes? |
| **Date of Birth** | Date | ✓ | DD-MM-YYYY | Age 18-65 | |
| **Nationality** | String | ✓ | Select list | Valid country | 🟡 |
| **CPR/ID Number** | String | ✓ | 12 digits | Valid format | 🟢 Confirmed (for Bahrain) |
| **Visa Status** | String | ✓ | [Valid/Expired/Pending] | - | Important for legal |

| **Address** | Text | ✓ | Full address | Min 10 chars | 🟡 For Bahrain or home country? |
| **Bank Account** | String | ✓ | IBAN | Valid IBAN | : For Salary/payouts |
| **Qualifications** | String | ✓ | [Certificate text] | Upload file |*: Doc storage needed |
| **Phlebotomy Cert** | String | ✓ | Upload PDF | Valid cert | 🟢 Confirmed |
| **Cert Expiry** | Date | ✓ | DD-MM-YYYY | Not expired |: Auto-alert system |
| **Status** | Enum | ✓ | [Active/Inactive/On Leave/Suspended] | - | 🟡 CLARIFICATION: What triggers suspension? |
| **Hired Date** | Date | ✓ | DD-MM-YYYY | Not future | Track for performance reviews |
| **Zone Assignment** | String | ✓ | Zone 1, 2, 3... | Select from map | 🟢 Confirmed |
| **Geofence Radius** | Integer | ✓ | Kilometers | 1-50 km radius | 🟢 Confirmed |
| **Working Hours** | Time Range | ✓ | HH:MM – HH:MM | Valid range | 🟡 CLARIFICATION: Flexible or fixed? |
| **Days Worked** | String | ✓ | [Mon-Sun] | Multi-select | Weekly pattern |
| **Equipment Issued** | Array | ✓ | [Bag, Vials x100, Gloves...] | Track qty | Inventory tracking |
| **Mobile Device** | String | ✓ | Device IMEI/UUID | Tracked | 🟢 Confirmed (for app) |
| **Emergency Contact** | String | ✓ | Name + Phone | Validated |
| **Performance Score** | Decimal | - | 0-100% | Calculated | 🟠 Real-time update |
| **Average Rating** | Decimal | - | 1.0-5.0 | Based on reviews | 🟢 Confirmed |
| **Total Collections** | Integer | - | Auto-count | - | 🟢 Confirmed |
| **Success Rate** | Percentage | - | Auto-calc | - |
| **Attendance Rate** | Percentage | - | Auto-calc | - | 🟠 For KPI |
| **Last Active** | DateTime | - | DD-MM-YYYY HH:MM | Real-time | For availability check |

### 1.3.2 Phlebotomist List View

```
PHLEBOTOMIST MANAGEMENT
═══════════════════════════════════════════════════════

[+ Add New Phlebotomist] [Import from Excel] [Settings]

┌─────────────────────────────────────────────────────┐
│ Search: [_____] Status: [All ▼] Zone: [All ▼] Sort ▼ │
└─────────────────────────────────────────────────────┘
```

Phlebo ID	Name	Zone	Status	Rating (Avg)
045	Fatima Al-Rashid	Zone 3	🟢 Online	4.8 ⭐

	+973-33123456	18 min ETA	(Active)	(250 jobs)
032	Mohammed Hassan +973-39876543	Zone 1 Zone 2	🟡 Break (Return)	4.6 ⭐ (180 jobs)
018	Noor Al-Mansoori +973-31234567	Zone 2 25 km	Off (Leave)	3.9 ⭐ (95 jobs)

[View Details] [Edit] [Assign Zone] [Deactivate] [Performance]
```

🔴 ** COLUMNS To be included**:
- Last Health Check Date
- Phlebotomy Cert Expiry (with warning if <30 days)
- Current Assignment (current booking/task)
- Pending Issues (any violations/complaints)

1.3.3 Phlebotomist Profile Detail View

```

PHLEBOTOMIST PROFILE - FATIMA AL-RASHID (PHLEBO-045)
═══════════════════════════════════════════════════════

[Basic Info] [Performance] [Assignments] [Documents] [Payouts]
[Incidents]

BASIC INFORMATION

```
  Full Name: Fatima Al-Rashid
  Phlebo ID: PHLEBO-045
  Status: 🟢 ACTIVE (Online)
  Phone: +973-33123456
  Email: fatima@email.com
  CPR: 312345678901
  DOB: 15-JAN-1995 (Age:31)
  Nationality: Bahraini
  Hired Date: 15-AUG-2023
  Zone Assignment: Zone 3 (East Manama)
  Geofence Radius: 15 km
  Working Hours: 8:00 AM - 6:00 PM
  Days Worked: Mon-Sat
```

DOCUMENTS & CERTIFICATIONS

```
  ✓ Phlebotomy Certificate
    Exp: 15-JAN-2027 (1 year remaining)
    [Download] [Verify]

  ✓ Health Insurance Policy
    Policy #: POL-2025-1234567
```

```
   Valid until: 31-DEC-2026             |
   [View]                               |
                                        |
 ✓  CPR/BLS Certification               |
   Exp: 20-FEB-2026 (52 days remain)    |
   ⚠  ALERT: Renew by Feb 15            |
   [Download] [Schedule Renewal]        |
                                        |
 ⭕  Background Check                    |
   Status: ✓ CLEARED (15-AUG-2023)      |
   [View Report]                        |
```

PERFORMANCE METRICS (Last 30 days)

```
 Total Collections:       156          |
 Completed Successfully:  155 (99.4%)   |
 Collections This Week:   32            |
 Average Rating:          4.8/5.0  ⭐   |
 Average Completion Time: 18 min        |
 Complaints:              0             |
 Performance Score:       94%           |
 KPI Status:              ✓ EXCELLENT   |
 Trend:                   📈 +2% (↑)    |
```

CURRENT ASSIGNMENT

```
 Current Task:     ORD-2025-001234
 Patient:          Ahmed Hassan
 Location:         Villa 145, Manama
 ETA:              8 minutes
 Tests:            CBC, Thyroid
 Status:           En Route
 [Map] [Call Patient] [Chat]
```

EQUIPMENT ISSUED (Current)

```
 Phlebotomy Bag:        1              |
 EDTA Tubes (3mL):      78 of 100
 SST Tubes (5mL):       42 of 50
 Lancets:               95 of 100
 Gloves (pairs):        8 of 20
 Syringes (23G):        12 of 20
 Cotton Swabs:          15 of 30
 [Request More Items]
```

ACTION BUTTONS
[✏ Edit] [📍 Track GPS] [📞 Call] [💬 Send Message] [⚠ Report Issue]
[🔄 Reassign Zone] [⏸ Pause] [🚫 Deactivate] [💰 View Payroll]
```
```

🔴 ** FEATURES to be considered**:
- Document expiry alert system (auto-alert 30 days before expiry)
- Incident/complaint tracking with resolution status
- Training history and skill certifications (difficulty vein, pediatric, elderly, etc.) -
- Weekly schedule management (shift planning)
- Equipment return/reconciliation process

1.4 RIDER MANAGEMENT MODULE

1.4.1 Rider Master Database

Field Name	Data Type	Required	Format	Notes
Rider ID	String	✓	RIDER-XXXX	Auto-generated
Full Name	String	✓	First + Last	🟢 Confirmed
Phone	String	✓	+973-XXXXX	🟢 Confirmed
Email	String	✓	email@domain.com	🟡 Mandatory?
CPR/ID	String	✓	12 digits	🟢 Confirmed
Vehicle License	String	✓	License plate	🟡 CLARIFICATION: Own vehicle or company?
Valid License Until	Date	✓	DD-MM-YYYY	Auto-alert before expiry
Zone Assignment	String	✓	Zone 1, 2, 3	🟢 Confirmed
Delivery Radius	Integer	✓	KM	🟡 CLARIFICATION: How many zones?
Status	Enum	✓	[Active/Inactive/On Leave]	🟢 Confirmed
Hired Date	Date	✓	DD-MM-YYYY	🟠 For performance review
Performance Score	Decimal	-	0-100%	Track delivery success
Avg Rating	Decimal	-	1.0-5.0	🟠 From labs/phlebos

🔴 **Points to be considered**:
- Driver safety violations tracking
- Delivery success/failure metrics

1.4.2 Delivery Task Management

```
DELIVERY TASK QUEUE
═══════════════════════════════════════════════════
```

| [Assign New Tasks] [Optimize Routes] [View Map] |
| Status: [All ▼] Rider: [All ▼] Priority: [All ▼] Sort ▼ |

Task ID	Collection Pt	Lab	Rider	Status
TASK-001	Villa 145, Manama	Central L.	Rider 003	🟢 In

```
|              | Ready at 10:53   | Downtown | (2 km away) | Transit|
|--------------|------------------|----------|-------------|--------|
| TASK-002     | Clinic A, Saar   | Advanced | Rider 005   | 🟡 Wait|
|              | Ready at 11:15   | Diagnostics | (Avail)  | Assign |

[View Details] [Reassign] [Route Optimize] [Track GPS]
```

1.5 LAB & TEST MANAGEMENT MODULE

1.5.1 Lab Master Setup

Field Name	Data Type	Required	Format	Notes
Lab ID	String	✓	LAB-XXXX	Auto-generated
Lab Name	String	✓	Official name	🟢 Confirmed
Lab Code	String	✓	3-4 chars	For abbreviation
License Number	String	✓	License #	Verification needed
Accreditation	String	✓	[CAP/CLSI/ISO 15189] Critical for quality
Contact Person	String	✓	Name	🟢 Confirmed
Phone	String	✓	+973-XXXXX	🟢 Confirmed
Email	String	✓	email@domain.com	🟢 Confirmed
Address	String	✓	Full address	🟢 Confirmed
Geolocation	Coordinates	✓	Lat/Long	🟢 Confirmed
Operating Hours	Time Range	✓	HH:MM - HH:MM	🟡 CLARIFICATION: Daily or variable?
Sample Intake Hours	Time Range	✓	HH:MM - HH:MM	If Different from operating?
Report TAT	String	✓	"24 hours"	🟢 Confirmed
Max Samples/Day	Integer	-	999	For capacity planning
API Integration	String	✓	API endpoint	For automated data sync
LIS System	String	✓	[System name]	🔴 For interoperability
Payment Terms	String	✓	[Net 30/Net 60]	🟡 CLARIFICATION: B2B terms?
Commission Rate	Percentage	✓	%	🔴 How much % of revenue?
Status	Enum	✓	[Active/Suspended/Inactive]	🟢 Confirmed

1.5.2 Test Catalog Management

```
TEST CATALOG MASTER
═══════════════════════════════════════════════════════

[+ Add Test] [Import from Excel] [Bulk Upload] [Settings]

 Search: [_____] Lab: [All Labs ▼] Category: [All ▼]
```

Test ID	Test Name	Sample Type	Lab Partner	Price both) (B2B/B2C)	TAT
TEST-001	Complete Blood Count (CBC)	EDTA 3mL	Central L. Downtown	80/150 BHD	24h
TEST-002	Comprehensive Metabolic Panel	SST 5mL	Advanced Diag	120/250 BHD	24h

[View] [Edit] [Archive] [Pricing History] [View Results] [Upload Bulk]
```

Test Record Structure

```

TEST DETAILS - COMPLETE BLOOD COUNT (CBC)
═══════════════════════════════════════════════════════

[Basic Info] [Lab Setup] [Sample Specs] [Pricing] [Results Template]
[Sample Type] [Container Type]

BASIC INFORMATION

```
Test ID: TEST-001
Test Name: Complete Blood Count (CBC)
Category: Hematology
Alternative Names: Full Blood Count (FBC), Hemogram
Test Description: Measures WBC, RBC, Hb, MCV, platelets
Clinical Use: Screen for anemia, infections, etc
Relevant Age: All ages
Fasting Required: No
Preparation: None
Special Precautions: None
[Sample Type]:   Serum
[Container Type]:   Vials/ Tube
```

SAMPLE SPECIFICATIONS

```
Sample Type:          EDTA (Purple Top Tube)
Volume Required:      3 mL
Collection Method:    Venipuncture (butterfly needle: 23G)
Collection Arm:       Preferred left arm
Storage Temp:         2-8°C
Stability (Room):     4 hours
Stability (Refrig):   24 hours
Anticoagulant:        EDTA (K2 or K3)
Mix Ratio:            1:8 (Draw 3mL with 3-5mm headspace)
```

```
    Hemolysis Alert:      If visual hemolysis present
    Lipemia Acceptable:   Yes
    Icterus Acceptable:   Yes
```

LAB ASSIGNMENT (Multiple Labs Can Do This Test)

```
    Primary Lab:          Central Lab (Downtown Branch)
     • B2B Price:         80 BHD
     • B2C Price:         150 BHD
     • Margin:            70 BHD (46.7%)
     • TAT:               24 hours
     • Equipment:         Sysmex XN-1000 Hematology Analyzer

    Secondary Lab:        Advanced Diagnostics
     • B2B Price:         75 BHD
     • B2C Price:         145 BHD
     • Margin:            70 BHD (48.3%)
     • TAT:               18 hours
     • Equipment:         Abbott Sapphire Analyzer

    [Add Lab] [Set Default]
```

PRICING HISTORY (Last 90 days)

```
    15-DEC-2025  B2C: 150 BHD → 155 BHD (Updated)
    01-DEC-2025  B2B: 75 BHD → 80 BHD (Updated)
    15-NOV-2025  B2C: 145 BHD → 150 BHD (Updated)
    [View Full History]
```

``

🔴 **Features**:

- Drug interactions/factors affecting result
- Test cancellation policy
- margin calculation with B2B and B2C rate
- Related test recommendations (if this test abnormal, suggest...)

1.6 BILLING & INVOICING MODULE

1.6.1 Invoice Generation & Management

```
INVOICE MANAGEMENT
═══════════════════════════════════════════════════════════

[Generate Invoice] [Bulk Invoice] [Email All] [Export] [Settings]
```

Status: [All ▼] Date: [Last 30 Days ▼] Patient: [_____]Payment
Type: [Cash]

Invoice ID	Customer	Amount	Status	Actions
INV-2025-001234	Ahmed Hassan +973-33123456	350 BHD (01-JAN)	✓ Paid (Card)	Email Download
INV-2025-001235	Fatima Ali fatima@email...	500 BHD (02-JAN)	🟡 Sent (Pending)	Resend Cancel

```

#### Invoice Template

```

```
┌─────────────────────────────────────────────────────────────┐
│                     TASHEEL HEALTHCARE                        │
│                       Tax INVOICE                          │  │
└─────────────────────────────────────────────────────────────┘
```

INVOICE DETAILS   PATIENT INFORMATION
─────────────────────────   ─────────────────────────

Invoice #:   INV-2025-001234   Name: Ahmed Hassan
Al-Dosari   Al-Dosari
Invoice Date: 02-JAN-2026   Patient ID: PAT-2025-005678
Due Date: 09-JAN-2026   Phone: +973-33123456
Period: 02-JAN-2026   Email: ahmed@example.com
Payment Terms:Net 7 days   CPR/ID: 312345678901

TASHEEL DETAILS   COLLECTION DETAILS
─────────────────────────   ─────────────────────────

Tasheel Healthcare W.L.L.   Collection Date: 02-JAN-2026 10:30
AM
License: TH-2025-001   Collection Time: 2 minutes
VAT Reg: (if applicable)   Collector: Fatima Al-Rashid
Phone: +973-XXXX-XXXX   Location: Villa 145, Manama

═══

ITEMIZED SERVICES
───

Test #	Test Name	Qty	Unit Price	Amount	Lab Partner
1	Complete Blood Count	1	150 BHD	150 BHD	Central Lab
2	Thyroid Profile (TSH)	1	250 BHD	250 BHD	Advanced Diag

SUBTOTAL: 400 BHD
First-Time Customer Discount (FIRST50):   -50 BHD
TOTAL TESTS: 350 BHD

```
Tax (VAT @ 0%):                                    0 BHD
_____
TOTAL AMOUNT DUE:                                  350 BHD

PAYMENT INFORMATION
_____
Payment Method:    Visa Card (Last 4 digits: 1234)
Payment Status:    ✓ COMPLETED on 02-JAN-2026 10:31 AM
Transaction ID:    TXN-2025-9876543
Payment Ref:       PKY-2025-001234

NOTES
_____
• Reports will be available within 24 hours
• Smart Health Reports available at: https://smartreport.tasheel.bh/...
• Download your reports at: www.tasheel.bh/reports/...
• Questions? Contact: support@tasheel.bh

_____
                    Thank you for choosing Tasheel!
_____
```

🔴 **Other Points**:
- Tax calculation (VAT to be Included in Invoice)
- Insurance claim details (if patient claimed through
insurance)-Insurance Module
- Payment plan options (if amount > threshold)-Future Module
- Refund/credit memo generation

1.7 FINANCIAL MANAGEMENT & REPORTING

1.7.1 Revenue Dashboard

```
FINANCIAL DASHBOARD
════════════════════════════════════════════════════════════════

Date Range: [01-JAN-2026 ▼] to [02-JAN-2026 ▼] [Generate Report]

TODAY'S REVENUE SUMMARY

┌──────────────────────────────────────────────────────────────┐
│  Total Revenue:          5,250 BHD                             │
│  Direct Collections:     3,200 BHD (61%)                       │
│  Lab Partnerships:       1,950 BHD (37%)                       │
│  Insurance Claims:       100 BHD (2%)                          │
│  Refunds:                -0 BHD                                │
│  Net Revenue:            5,250 BHD                             │
│  Avg Transaction:        42 BHD                                │
└──────────────────────────────────────────────────────────────┘


PAYMENT BREAKDOWN (Today)
```

```
┌─────────────────────┬──────────┬──────────┬──────────────────────┐
│ Payment Method      │ Count    │ Amount   │ Success Rate         │
├─────────────────────┼──────────┼──────────┼──────────────────────┤
│ Card/Online         │ 85       │ 3,500    │ 98.8% (1 failed)     │
│ Cash on Delivery    │ 25       │ 1,250    │ 100%                 │
│ Bank Transfer       │ 5        │ 500      │ 100%                 │
│ Failed/Pending      │ 1        │ -        │ -                    │
└─────────────────────┴──────────┴──────────┴──────────────────────┘

CUMULATIVE (This Month)

┌─────────────────────────────────────────────────────────────────┐
│ Month-to-Date Revenue:       15,750 BHD (2 days)               │
│ Monthly Target:              50,000 BHD                        │
│ Achievement:                 31.5% (On Track)                  │
│ Daily Average:               7,875 BHD                         │
│ Projected Month-End:         ~236,250 BHD                      │
└─────────────────────────────────────────────────────────────────┘
```

1.7.2 Advanced Reports Module

Report Types Available

Report Name	Data Points	Filters	Export	Frequency
Revenue Report	Revenue, volume, payment method, source	Date, location, test type	PDF, Excel	Daily/Monthly
Sales by Lab	Revenue by partner lab, tests, margin	Lab, date range	Excel	Weekly
Customer Segmentation	By age, tests, frequency, spend	Demographics, test type	Excel	Monthly
Phlebotomist Performance	Collections, rating, incidents, revenue	Phlebo, date range	Excel	Weekly
Inventory Report	Stock issued, returned, consumed	Item type, phlebo	PDF, Excel	Weekly
Vendor Reconciliation	Tests booked vs results delivered, costs vs billing	Lab, date range	Excel	Monthly
Insurance Claims	Submitted, approved, rejected, pending	Insurance company, status	Excel	Weekly
SLA Compliance	On-time delivery, report generation, customer satisfaction	Lab, location	PDF	Monthly
Receivables Report	Outstanding amounts, aging, collection status	Lab, customer	Excel	Weekly
Customer Acquisition Cost	Cost per customer, retention rate, LTV	Channel, period	PDF, Excel	Monthly

🔴 **Other Features**:
- Custom report builder (drag-drop fields)
- Power BI integration for dashboards
- Scheduled report distribution (auto-email)
- Real-time alerts (when metric crosses threshold)
- Year-over-year comparison

- Patient's List by Data filter of Paitent report parameters Eg List of patients with above 150 sugar reading based on all the report database.

1.8 ADMIN SETTINGS & SYSTEM CONFIGURATION

1.8.1 System Settings Module

```
SYSTEM SETTINGS
═══════════════════════════════════════════════════════════

[General] [Notifications] [Integrations] [API] [Compliance]

GENERAL SETTINGS
┌─────────────────────────────────────────────────────────┐
│  🔧  OPERATIONAL SETUP                                   │
│                                                          │
│  Operating Hours (All Days):                             │
│    Start Time: [08:00 AM ▼]  End Time: [06:00 PM ▼]    │
│                                                          │
│  Holidays/Non-Working Days:                              │
│    Add: [ _____ ] [+ Add Holiday]                  │
│    • National Day (18-FEB) - Added                       │
│    • Ramadan (varies) - Add annually                     │
│                                                          │
│  Service Areas:                                          │
│    [✓] Manama    [✓] Al Hoora   [✓] Riffa   [✓] Saar   │
│    [✓] Muharraq [✓] Hamad Town [✓] East Coast          │
│    [+ Add New Area]                                      │
│                                                          │
│  Currency:                  [BHD ▼]                      │
│  Language (Default):        [English ▼]                  │
│  Timezone:                  [GMT +3 ▼]                   │
│  VAT Rate (if applicable):  [0% ▼]                      │
│                                                          │
│  [Save Changes]                                          │
└─────────────────────────────────────────────────────────┘
```

1.9 AUDIT & COMPLIANCE LOGGING

1.9.1 Audit Trail

```
AUDIT LOGS & ACTIVITY TRACKING
═══════════════════════════════════════════════════════════

[Filters: Date Range ▼] [User ▼] [Module ▼] [Action ▼]

┌──────────────────┬─────────────────────┬──────────┬──────────
```

Timestamp	User	Action	Details
02-JAN 10:45 AM	Admin (Ops Team)	Create Booking	Booking ORD-001
02-JAN 10:46 AM	System (Assignment)	Auto-Assign	Assigned to 045
02-JAN 10:50 AM	Phlebo-045 (Fatima)	Collect Sample	Sample ready

🔴 **Points to consider**:
- What % of data is logged?
- Retention policy (how long kept)?
- Who can access logs?
- Log export format (JSON/CSV)?
```

SECTION 2: PATIENT APP (CUSTOMER INTERFACE)
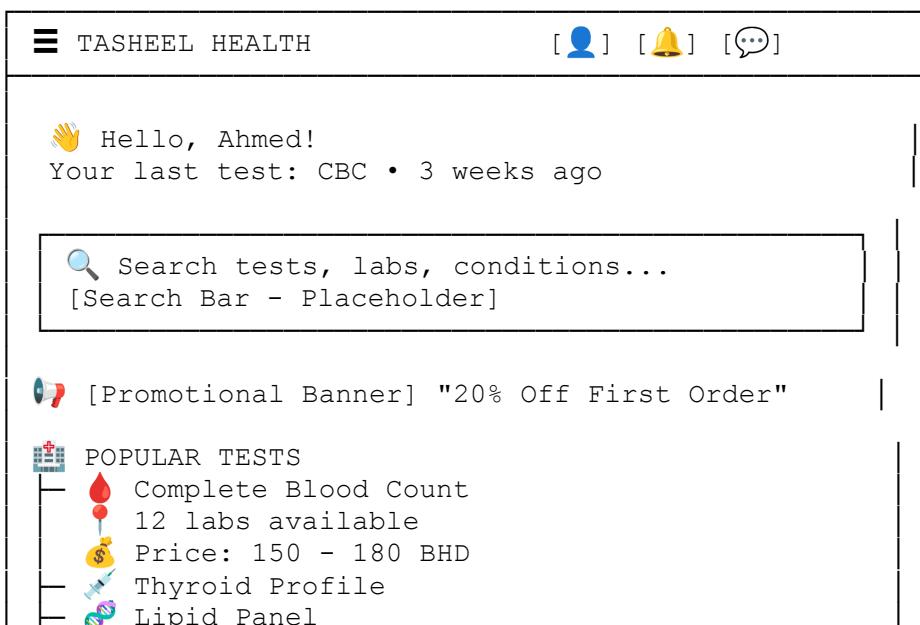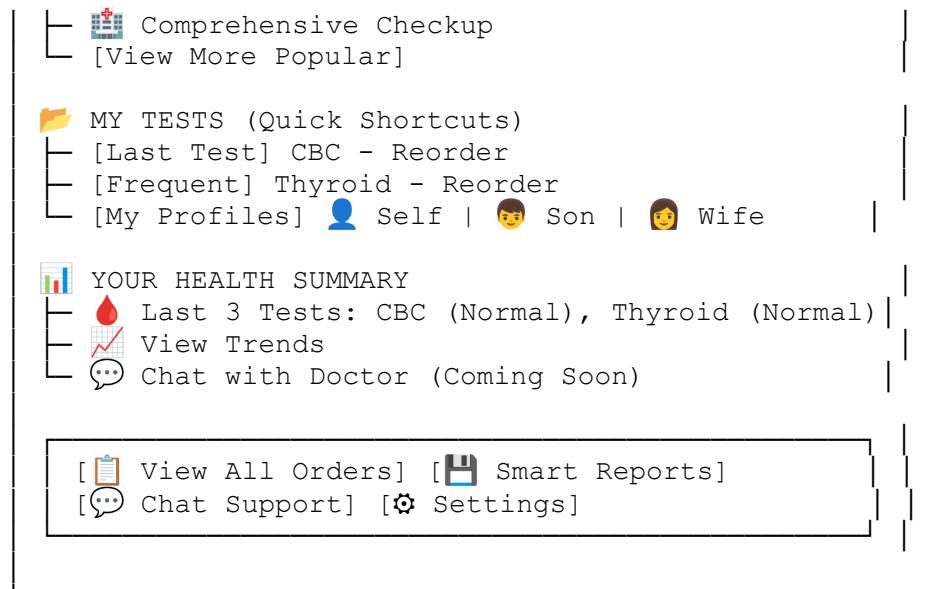
Platform: iOS & Android (Flutter)
Purpose: Enable customers to discover, book, track, and manage lab tests

---

2.1 PATIENT APP - HOME SCREEN

```
┌─────────────────────────────────────────────┐
│ ☰  TASHEEL HEALTH          [👤] [🔔] [💬]    │
├─────────────────────────────────────────────┤
│                                             │
│  👋  Hello, Ahmed!                          │
│  Your last test: CBC • 3 weeks ago          │
│                                             │
│   ┌─────────────────────────────────────┐   │
│   │ 🔍  Search tests, labs, conditions... │ │
│   │ [Search Bar - Placeholder]          │   │
│   └─────────────────────────────────────┘   │
│                                             │
│  📣 [Promotional Banner] "20% Off First Order" │
│                                             │
│  🏥 POPULAR TESTS                           │
│   ├─ 🩸 Complete Blood Count                │
│   │   💉 12 labs available                  │
│   │   💰 Price: 150 - 180 BHD               │
│   ├─ 💉 Thyroid Profile                     │
│   ├─ 🧬 Lipid Panel                         │
```

```
   ├─ 🏥 Comprehensive Checkup                     |
   └─ [View More Popular]                          |
                                                     |
   📁 MY TESTS (Quick Shortcuts)                    |
   ├─ [Last Test] CBC - Reorder                     |
   ├─ [Frequent] Thyroid - Reorder                  |
   └─ [My Profiles] 👤 Self | 👦 Son | 👩 Wife       |
                                                     |
   📊 YOUR HEALTH SUMMARY                           |
   ├─ 🩸 Last 3 Tests: CBC (Normal), Thyroid (Normal)|
   ├─ 📈 View Trends                                |
   └─ 💬 Chat with Doctor (Coming Soon)             |
                                                     |
   ┌──────────────────────────────────────┐        |  |
   | [📋 View All Orders] [💾 Smart Reports] |       |  |
   | [💬 Chat Support] [⚙ Settings]         |       |  |
   └──────────────────────────────────────┘        |  |
                                                        |
```

🔴 **Points to consider**:
- Recommendations based on age/health profile
- Insurance acceptance display (Future Module)
- Loyalty points balance
- Referral program CTA

2.2 TEST SEARCH & DISCOVERY
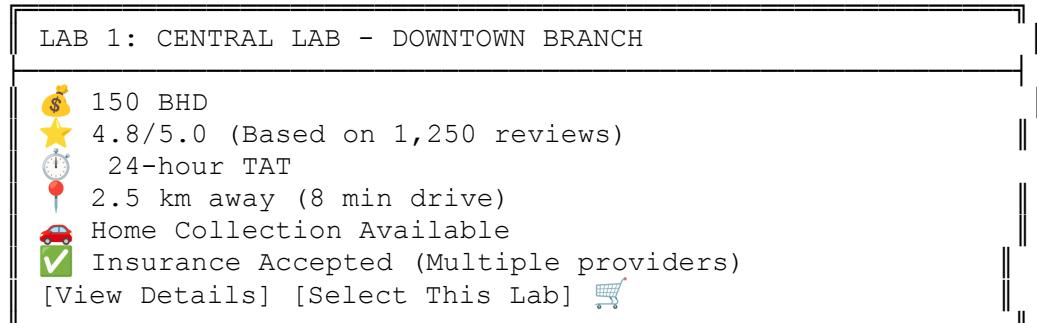
2.2.1 Search Results Screen

```
SEARCH RESULTS - "CBC"
═══════════════════════════════════════════════

Back    [Complete Blood Count ▼]  [Filter] [Sort ▼]

_____

📊 Results: 12 labs available

┌──────────────────────────────────────────┐ ║
| LAB 1: CENTRAL LAB - DOWNTOWN BRANCH       | ║
├──────────────────────────────────────────┤ ║
| 💰 150 BHD                                 | ║
| ⭐ 4.8/5.0 (Based on 1,250 reviews)        | ║
| ⏱ 24-hour TAT                             | ║
| 📍 2.5 km away (8 min drive)               | ║
| 🚗 Home Collection Available               | ║
| ✅ Insurance Accepted (Multiple providers) | ║
| [View Details] [Select This Lab] 🛒        | ║
└──────────────────────────────────────────┘ ║
```

```
┌─────────────────────────────────────────────────┐
│ LAB 2: ADVANCED DIAGNOSTICS                     │
├─────────────────────────────────────────────────┤
│ 💰 160 BHD                                    ║  │
│ ⭐ 4.9/5.0 (Based on 890 reviews)             ║  │
│ ⏱️  18-hour TAT (Faster!)                     ║  │
│ 📍 3.1 km away (10 min drive)                 ║  │
│ 🚗 Home Collection Available                  ║  │
│ ✅ Insurance Accepted (Multiple providers)    ║  │
│ [View Details] [Select This Lab] 🛒           ║  │
└─────────────────────────────────────────────────┘
```

[View 10 More Labs]
```

### 2.2.2 Lab Detail Card

```

ADVANCED DIAGNOSTICS - DETAILED VIEW
═══

[Back]

COMPLETE BLOOD COUNT (CBC)
───

💰 PRICING
├─ Lab Price: 160 BHD
├─ Price Comparison: 12 labs (150-200 BHD)
├─ You Save: 10-40 BHD by choosing us
└─ [Apply Coupon] [Loyalty Discount]

⭐ RATINGS & REVIEWS
├─ Overall: 4.9/5.0 (890 reviews)
├─ Sample Collection: 4.8/5.0
├─ Report Quality: 4.9/5.0
├─ Staff Professionalism: 5.0/5.0
└─ [View All Reviews]

ℹ️ TEST INFORMATION
├─ What It Tests:
│   White blood cells, Red blood cells, Hemoglobin,
│   Hematocrit, Platelets
├─ Why It's Done:
│   Screen for anemia, infection, or blood disorder
├─ Preparation:
│   No fasting required, no special prep
├─ Sample Type:
│   EDTA (Purple top tube)
├─ Sample Volume:
│   3 mL
└─ [Read Full Details]
```

```
🏥 LAB INFORMATION
├─ Lab: Advanced Diagnostics Lab
├─ Located: Al Manama, Bahrain
├─ Accreditation: CAP Accredited
├─ Experience: 15+ years
├─ Equipment: Abbott Sapphire Analyzer
├─ [View Lab Profile] [Read Lab Reviews]

📊 TAT & AVAILABILITY
├─ Standard TAT: 18 hours
├─ Express TAT: 6 hours (+50 BHD)
├─ Next Available Slot: 02-JAN-2026 2:00 PM
├─ [View All Available Slots]

🚗 COLLECTION
├─ Home Collection Available: ✓ Yes
├─ Collection Fee: Included in price
├─ Available Hours: 8 AM - 6 PM
├─ Service Area: 15 km radius

🏥 WALK-IN OPTION
├─ Walk-in Accepted: ✓ Yes
├─ Location: Al Manama Clinic
├─ Hours: 8 AM - 6 PM (Daily)
├─ Address: [Full Address]
├─ [Get Directions]

┌─────────────────────────────────────────────────┐
│  [Add to Cart] [Compare with Other Labs] [Save for Later] │
└─────────────────────────────────────────────────┘
```

🔴 **points to be consider**:
- Related tests (if CBC abnormal, suggest follow-up tests)
- Contraindications (medications, conditions affecting result)
- FAQs about this specific test
- Video on how collection works

2.3 BOOKING FLOW (50-SECOND CHECKOUT)

Step 1: Select Test & Lab

```
STEP 1 OF 4: SELECT TEST & LAB
═══════════════════════════════════════════════════

[Back] Complete Blood Count - Advanced Diagnostics

Price: 160 BHD  |  TAT: 18 hours  |  ⭐ 4.9/5.0

┌─────────────────────────────────────────────────┐
│  Sample Collection Method:                       │
```

```
    ◯   Home Collection (Recommended)    📍 Walk-In at Lab      |
                                                                 ||
   (If Home Collection selected)                                 |
   Preferred Date: [02-JAN-2026 ▼]                               |
   Preferred Time: [02:00 PM - 04:00 PM ▼]                       |
                                                                 |
   (If Walk-In selected)                                         |
   Date: [02-JAN-2026 ▼]                                         |
   Time Slot: [02:00 PM ▼]                                       |
```

```
    🟢   Patient Profile to Use:                                |
    ◯ Myself (Ahmed Hassan)                                     |
    ◯ Family Member: [Select ▼]                                 |
   + Add New Family Member                                      |
```

[Back] [Next: Address & Special Requirements]
```

🔴 **Points to Consider**:
- Option to select multiple tests at once (test bundle)
- Bulk discount display if multiple tests selected
- Comparison with other labs online

Step 2: Address & Special Requirements

```
STEP 2 OF 4: COLLECTION ADDRESS & REQUIREMENTS
═══════════════════════════════════════════════════════════

📍 COLLECTION ADDRESS

Current Address (Last Used):
├─ Villa 145, Al Manara District, Manama 428 ✓ Selected
├─ [Confirm This Address] OR [Use Different Address]

[Map] [Edit Address] [Use Saved Address]

OR Enter New Address:
├─ Street Address: [_____]
├─ Building/Villa: [_____]
├─ Floor/Apt:      [_____]
├─ Zone/District:  [Al Manara ▼]
├─ Postal Code:    [428_____]
├─ Building Images: [Add Photos] (Optional)
└─ [Confirm Address]


─────────────────────────────────────────────────────────

💬 SPECIAL REQUIREMENTS (Optional)

☐ Special Collection Instructions:
```

```
    [Gate is locked, call on arrival_____]

☐ Difficult Vein / Previous Issues:
  [Left arm preferred, fragile vein_____]

☐ Accessibility Required:
  [Ground Floor / Wheelchair Accessible]

☐ Preferred Phlebotomist Gender:
  [Female ▼]

[Next: Review & Payment]
```

Step 3: Review Order

```
STEP 3 OF 4: REVIEW YOUR ORDER
═══════════════════════════════════════════════════════

BOOKING DETAILS
┌──────────────────────────────────────────────────────┐
│ Test: Complete Blood Count (CBC)                     │
│ Lab: Advanced Diagnostics                            │
│ Collection: Home Collection                          │
│ Date: 02-JAN-2026                                    │
│ Time: 2:00 PM - 4:00 PM                              │
│ Address: Villa 145, Al Manara District, Manama 428   │
│ Patient: Ahmed Hassan Al-Dosari                      │
└──────────────────────────────────────────────────────┘

PRICING BREAKDOWN
┌──────────────────────────────────────────────────────┐
│ Test Price:                      160 BHD             │
│ Home Collection Fee:             Included            │
│ Subtotal:                        160 BHD             │
│ First-Time Customer Discount (FIRST50):  -50 BHD     │
│ Coupon Code Applied (FIRST50):       -50 BHD         │
│ Tax:                             0 BHD               │
│ ─────────────────────────────────────────────        │
│ TOTAL AMOUNT:                    110 BHD             │
│ Original Price: 160 BHD | You Save: 50 BHD (31%)     │
└──────────────────────────────────────────────────────┘

ORDER SUMMARY
├─ Booking Confirmation: Will be sent via SMS, WhatsApp, Email
├─ Phlebotomist Details: Sent 1 hour before arrival
├─ Tracking Link: Available in app & email
├─ Report Availability: 02-JAN-2026 (18 hours)
├─ Smart Report: Automatically generated
└─ Report Access: Lifetime access, downloadable PDF

[Edit Order] [Proceed to Payment]
```

Step 4: Payment

```
STEP 4 OF 4: PAYMENT
═══════════════════════════════════════════════

AMOUNT TO PAY: 110 BHD

PAYMENT METHOD

Select Payment Option:
┌──────────────────────────────────────────┐
│  ◯  Credit/Debit Card                      │
│     Visa, Mastercard, AmEx                 │
│     Processing time: Instant               │
│                                            │
│  ◯  Digital Wallet                         │
│     Apple Pay, Google Pay                  │
│     Processing time: Instant               │
│                                            │
│  ◯  Bank Transfer                          │
│     Direct debit from bank                 │
│     Processing time: 1-2 hours             │
│                                            │
│  ◯  Pay on Delivery (Cash)                 │
│     Pay when phlebo arrives                │
│     Processing time: Collection day        │
│                                            │
│  ◯  Insurance Claim                        │
│     Through your insurance provider        │
│     [Select Insurance ▼]                   │
└──────────────────────────────────────────┘


BILLING ADDRESS
├─ Use Address on File: ✓
├─ [Edit if Different]

COUPON / PROMO CODE
├─ Code Applied: FIRST50 (-50 BHD)
├─ [Apply Another Code]

TERMS & CONDITIONS
├─ ✓ I agree to the Terms of Service
├─ ✓ I accept the Privacy Policy
├─ ✓ I understand the cancellation policy

[Cancel Order] [Complete Payment]
```

🔴 ** Points to consider**:
- Insurance direct billing integration
- Payment plan options (if amount > threshold)
- Loyalty points redemption option

- Gift voucher redemption

2.4 BOOKING TRACKING (REAL-TIME)

```
ORDER TRACKING - ORD-2025-001234
═══════════════════════════════════════════════════════════════

Status: 🟢 ASSIGNED - Phlebotomist En Route

┌─────────────────────────────────────────────────────────────┐
│  TIMELINE                                                    │
│  ✓ Booking Confirmed (10:30 AM)                              │
│  ✓ Payment Completed (10:31 AM)                              │
│  ✓ Phlebotomist Assigned (10:45 AM)                          │
│  ⏳ En Route (ETA: 8 minutes) → 10:53 AM                     │
│  🔴 Sample Collection (Pending)                              │
│  🔴 Delivered to Lab (Pending)                               │
│  🔴 Lab Processing (Pending)                                 │
│  🔴 Report Ready (Pending)                                   │
└─────────────────────────────────────────────────────────────┘

PHLEBOTOMIST DETAILS

┌─────────────────────────────────────────────────────────────┐
│  Name: Fatima Al-Rashid                                      │
│  Rating: 4.8/5.0 ⭐                                          │
│  Phlebotomist ID: PHLEBO-045                                 │
│  Current Location: 2 km away (GPS)                           │
│  ETA: 8 minutes (26.1550° N, 50.5540° E)                    │
│  [📞 Call] [💬 Message] [🗺 View Map]                       │
└─────────────────────────────────────────────────────────────┘

📍 COLLECTION ROUTE
├── Live Map Showing:
│    ├── Your Location (Villa 145, Manama)
│    ├── Phlebotomist Location (Moving towards you)
│    ├── Estimated Path
│    └── Traffic Conditions
│
├── [Share Location with Phlebo]
├── [Update Delivery Instructions]

📊 ORDER SUMMARY
├── Test: Complete Blood Count (CBC)
├── Lab: Advanced Diagnostics
├── Amount: 110 BHD (Paid ✓)
├── Report Ready: 02-JAN-2026 2:00 PM (18 hours)
├── [Download Invoice]

[Call Support] [Chat Support] [Report Issue]
```

2.5 REPORTS & SMART REPORT VIEW
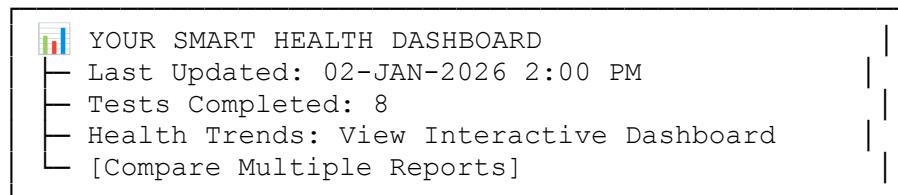
2.5.1 Reports List Screen

```
MY REPORTS & HEALTH DATA
════════════════════════════════════════════════════

[Search Reports] [Filter: Last 3 Months ▼] [View Analytics]

┌──────────────────────────────────────────────────┐
│ 📊 YOUR SMART HEALTH DASHBOARD                     │
│  ├─ Last Updated: 02-JAN-2026 2:00 PM             │
│  ├─ Tests Completed: 8                            │
│  ├─ Health Trends: View Interactive Dashboard     │
│  └─ [Compare Multiple Reports]                    │
└──────────────────────────────────────────────────┘


LATEST REPORTS
┌──────────────────────────────────────────────────┐
│ 📄 Report #8: Complete Blood Count (CBC)          │
│ Date: 02-JAN-2026 2:00 PM                         │
│ Lab: Advanced Diagnostics                         │
│ Status: ✓ Ready to View                           │
│ [📊 View Smart Report] [⬇ Download PDF]           │
├──────────────────────────────────────────────────┤
│ 📄 Report #7: Thyroid Profile                     │
│ Date: 08-DEC-2025 9:30 AM                         │
│ Lab: Central Lab                                  │
│ Status: ✓ Ready to View                           │
│ [📊 View Smart Report] [⬇ Download PDF]           │
├──────────────────────────────────────────────────┤
│ 📄 Report #6: Lipid Panel                         │
│ Date: 15-NOV-2025 10:00 AM                        │
│ Lab: Advanced Diagnostics                         │
│ Status: ✓ Ready to View                           │
│ [📊 View Smart Report] [⬇ Download PDF]           │
└──────────────────────────────────────────────────┘

[View All Reports] [Archive] [Share with Doctor]
```

2.5.2 Smart Report Interface
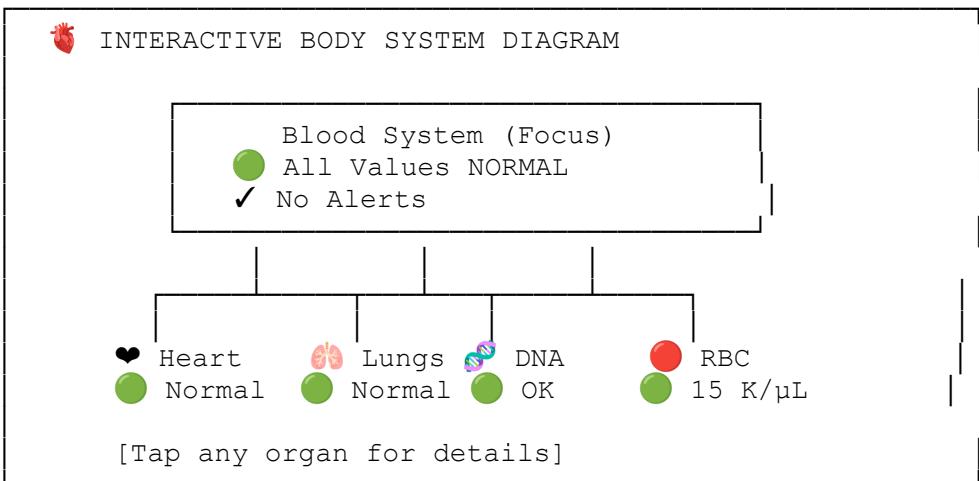
```
SMART HEALTH REPORT - COMPLETE BLOOD COUNT
════════════════════════════════════════════════════

Report Date: 02-JAN-2026  |  Patient: Ahmed Hassan Al-Dosari
Lab: Advanced Diagnostics  |  TAT: 18 hours
```

```
┌──────────────────────────────────────────────────┐
│  🫀  INTERACTIVE BODY SYSTEM DIAGRAM               │
│                                                    │
│       ┌──────────────────────────────┐            │
│       │      Blood System (Focus)     │           │
│       │  🟢  All Values NORMAL         │          │
│       │  ✓  No Alerts                 │           │
│       └──────────────────────────────┘            │
│              │        │        │                   │
│        ┌─────┴───┬────┴────┬───┴─────┐            │
│     ❤ Heart    🫁 Lungs  🧬 DNA      🔴 RBC       │
│     🟢 Normal  🟢 Normal 🟢 OK       🟢 15 K/µL   │
│                                                    │
│        [Tap any organ for details]                 │
└──────────────────────────────────────────────────┘
```

TEST RESULTS BREAKDOWN

Test Component	Your Value	Range	Status
White Blood Cells (WBC)	7.2 K/µL	4.5–11	🟢 OK
Red Blood Cells (RBC)	4.9 M/µL	4.5–5.9	🟢 OK
Hemoglobin	14.5 g/dL	13.5–17.5	🟢 OK
Hematocrit	43.2%	41–53	🟢 OK
Mean Corpuscular Vol	88 fL	80–100	🟢 OK
Platelets	250 K/µL	150–400	🟢 OK

🔍 DETAILED INSIGHTS

```
┌──────────────────────────────────────────────────┐
│  ✓  HEALTHY BLOOD PROFILE                          │
│    All blood cells are within normal range. Your blood │
│    count indicates a healthy immune system, good oxygen- │
│    carrying capacity, and normal clotting function. │
│                                                    │
│  💡  WHAT THIS MEANS:                              │
│    • No signs of anemia (low red blood cells)      │
│    • No active infection (normal white blood cells)│
│    • Normal blood clotting ability (normal platelets) │
│                                                    │
│  ✅  RECOMMENDATIONS:                              │
│    • Continue current lifestyle                    │
│    • Maintain balanced diet with iron-rich foods   │
│    • Stay hydrated (min 8 glasses water daily)     │
│    • Regular exercise (30 min most days)           │
│    • Next CBC: In 1 year (or if symptoms develop)  │
│                                                    │
│  🔗  RELATED INFORMATION:                          │
│    • What causes abnormal WBC? [Learn More]        │
│    • Iron-rich foods for blood health [Learn More] │
│    • Symptoms of blood disorders [Learn More]      │
└──────────────────────────────────────────────────┘
```

```
          |
COMPARISON WITH PREVIOUS RESULTS

 ┌─────────────────────────────────────────────┐
 │  vs. 08-DEC-2025 (Thyroid Profile)           │
 │  vs. 15-NOV-2025 (Lipid Panel)               │  │
 │                                              │
 │  [Show Trend Chart] [Compare Values]         │
 └─────────────────────────────────────────────┘


ACTION BUTTONS

 ┌─────────────────────────────────────────────┐
 │  [💬 Ask Doctor] [👥 Share with Family] [📧 Share Link]│
 │  [🖨  Print] [⬇ Download PDF] [📤 Export to Health App]│
 └─────────────────────────────────────────────┘
```

🔴 **Points to consider** (Smart Report Integration):
- Organ system visualization (clickable interactive diagram)
- Color coding (Green=Normal, Yellow=Caution, Red=Abnormal)
- Personalized recommendations based on age/gender/history
- Integration with health tracking wearables
- Doctor consultation booking (from report)
- Medicine/supplement recommendations based on results
- Food recommendations (what to eat/avoid)
- Lifestyle recommendations (exercise, sleep, etc.)

2.6 FAMILY PROFILES & DEPENDENT MANAGEMENT

```
FAMILY PROFILES
═══════════════════════════════════════════════

[+ Add Family Member]

Primary Account Owner:

 ┌─────────────────────────────────────────────┐
 │  👤 Ahmed Hassan Al-Dosari (YOU)             │
 │  Age: 32 years old                           │
 │  📊 Reports: 8 | Last Test: CBC (02-JAN-2026) │
 │  [View All Reports] [Edit Profile]           │
 └─────────────────────────────────────────────┘


Family Members:

 ┌─────────────────────────────────────────────┐
 │  👦 Zain Hassan Al-Dosari                    │
 │  Age: 5 years old (Pediatric Profile)        │
 │  Relationship: Son                           │
 │  📊 Reports: 2 | Last Test: Growth Screening │
 │  [View Reports] [Edit] [Remove]              │
 └─────────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────┐
│ 👩  Fatima Ahmad Al-Mansoori             │
│ Age: 30 years old                        │
│ Relationship: Wife                       │
│ 📊  Reports: 5 | Last Test: Women's Health Panel  │
│ [View Reports] [Edit] [Remove]           │
└─────────────────────────────────────────┘

[+ Add Another Family Member]
```

2.7 PATIENT APP - SETTINGS & PROFILE

```
SETTINGS
═══════════════════════════════════════════

[Account] [Notifications] [Privacy] [Support] [About]

ACCOUNT SETTINGS
┌─────────────────────────────────────────┐
│ 👤  PROFILE INFORMATION                  │
│ Full Name: Ahmed Hassan Al-Dosari        │
│ Email: ahmed@example.com                 │
│ Phone: +973-33123456                     │
│ CPR/ID: 312345678901                     │
│ DOB: 15-MAR-1993 (Age: 32)               │
│ Nationality: Bahraini                    │
│ Gender: Male                             │
│ Blood Type: O+                           │
│ [Edit Profile] [Change Photo]            │
│                                          │
│ 🔒  SECURITY                             │
│ Password: ••••••••                       │
│ [Change Password] [Two-Factor Auth ✓]    │
│ [View Login Activity] [Devices]          │
│                                          │
│ 📍  SAVED ADDRESSES                      │
│ • Home: Villa 145, Al Manara (Primary)   │
│ • Office: Business Plaza, Downtown        │
│ • Parents: Villa 89, Saar                │
│ [Add Address] [Edit] [Delete]            │
│                                          │
│ 💳  PAYMENT METHODS                      │
│ • Visa Card (Last 4 digits: 1234) - Primary │
│ • Mastercard (Last 4 digits: 5678)       │
│ [Add Payment Method] [Edit] [Delete]     │
│                                          │
│ ⬛   Language - English          │        │
│                                          │
│ 🎫  COUPON & LOYALTY               │      │
│ • Active Coupons: 3                      │
```

- Loyalty Points: 250 points (25 BHD value)
- Referral Code: TAH-AHMED-123
[View Available Offers] [Refer Friend]

NOTIFICATION SETTINGS

☑ Booking Confirmations
☑ Collection Reminders (1 hour before)
☑ Phlebotomist ETA Updates
☑ Report Ready Notifications
☑ Health Insights & Recommendations
☑ Promotional Offers
☑ News & Updates

Notification Channel:
☑ Push Notifications
☑ SMS
☑ Email
☑ WhatsApp

PRIVACY & DATA

☐ Allow Tasheel to send health insights
☐ Share anonymized data for research
☐ Allow marketing communications
[Privacy Policy] [Terms of Service]
[Data Deletion Request]
[Download My Data] [GDPR Compliance]

[Sign Out] [Delete Account] [Report Issue]

SECTION 3: PHLEBOTOMIST APP (FIELD OPERATIONS)

3.1 PHLEBOTOMIST AND RIDER APP - HOME SCREEN

SELECT ROLE: PHLEBOTOMIST
```
PHLEBOTOMIST SCREEN - HOME
═══════════════════════════════════════════════════

☰ TASHEEL PHLEBOTOMIST            [Fatima Al-Rashid ▼]

TODAY'S DASHBOARD

🟢 STATUS: ONLINE (Since 8:00 AM)
⏱️  DUTY TIME: 6 hours 45 minutes
📅 ZONE: Zone 3 (East Manama)
📍 CURRENT LOCATION: Villa 145, Manama
🔋 DEVICE BATTERY: 89%

```
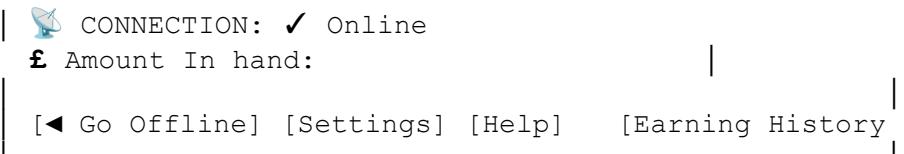| 📡  CONNECTION: ✓ Online
  £ Amount In hand:                           |
|                                                        |
  [◄ Go Offline] [Settings] [Help]    [Earning History |
```

TODAY'S METRICS
```
  Collections Completed: 8/12 Target (67%)              |
  Collections in Queue:  4 pending                      |
  Average Rating Today:  4.9/5.0 ⭐                     |
  Incidents/Complaints: 0                               |
  Stock Remaining: 45 tubes (90% utilization)           |
```

ACTIVE TASKS (NEXT 2 HOURS)
```
  🟢  CURRENT TASK (IN PROGRESS)                        |
  ├─ Patient: Ahmed Hassan Al-Dosari                    |
  ├─ Location: Villa 145, Al Manara, Manama             |
  ├─ Tests: CBC (3mL EDTA), Thyroid (5mL SST)           |
  ├─ Time Slot: 2:00 PM - 4:00 PM (ETA: 2:00 PM)        |
  ├─ Phone: +973-33123456                               |
  ├─ Special Notes: "Difficult vein - left arm"         |
  ├─ Status: En Route (GPS Navigation Active)           |
  ├─ ETA: 8 minutes away                                |
  └─ [📍 Navigate] [📞 Call] [💬 Message]               |
                                                        |
  🔴 UPCOMING (Next 45 min)                             |
  ├─ Patient: Noor Al-Mansoori                          |
  ├─ Location: Clinic A, Saar                           |
  ├─ Tests: CBC, Lipid Panel                            |
  ├─ Time Slot: 2:45 PM - 3:15 PM                       |
  └─ [Details] [Call] [Message]                         |
                                                        |
  🔴 UPCOMING (Later Today)                             |
  ├─ Patient: Mohammed Hassan                           |
  ├─ Location: Office Building B, Downtown              |
  └─ [Details]                                          |
```

[View All Today's Tasks] [Map View] [Reschedule]
```

🔴 **Points to Consider**:
- Collection history (how many tests collected today by type)
- Performance feedback (real-time rating as tasks complete)
- Earning History and Amount Receivable from Tasheel.

3.2 COLLECTION WORKFLOW IN PHLEBOTOMIST SCREEN

Step 1: Receive Task

```
TASK ASSIGNED - START COLLECTION
═══════════════════════════════════════════


🟢  NEW TASK NOTIFICATION

┌─────────────────────────────────────────┐
│ Ding! You have a new collection task!   │
│                                          │
│ Patient: Ahmed Hassan Al-Dosari         │
│ Location: Villa 145, Al Manara          │
│ Distance: 2 km (8 min away)             │
│ Tests: CBC (3mL), Thyroid (5mL)         │
│ Collection Window: 2:00 PM - 4:00 PM    │
│ Payment: 110 BHD (Online Paid)          │
│ Special Note: Difficult vein - left arm │
│                                          │
│ [📍 Accept & Start Navigation]  [Decline/Report] │
└─────────────────────────────────────────┘
```

Step 2: Navigate to Patient

```
NAVIGATION TO PATIENT
═══════════════════════════════════════════


[◀ Back to Tasks]

DESTINATION: Villa 145, Al Manara, Manama
Distance: 2.1 km
ETA: 7 minutes (Via Sheikh Jaber Al-Ahmed Road)
```

```
        ┌─────────────────────────────────┐
        │ 🗺️   GOOGLE MAPS VIEW           │
        │                                  │
        │ Current Location: ⭐             │
        │ Destination:      📍 Villa 145   │
        │ Route (Blue):        ═══════     │
        │                                  │
        │ [Map will show live turn-by-turn]│
        └─────────────────────────────────┘
```

↓ CONTINUE ON ROAD FOR 1.2 KM

PATIENT DETAILS

```
┌─────────────────────────────────────────┐
│ Name: Ahmed Hassan Al-Dosari            │
│ Phone: +973-33123456                    │
│ CPR: 312345678901                       │
│ Age: 32 | Male                          │
│ Blood Type: O+                          │
│ Allergies: Latex, Iodine                │
│ Previous Issue: Difficult vein (left arm) ⚠  │
```

```
   Collection Instructions:                             |
    "Gate is locked. Call on arrival. Ring bell"        |
                                                        |
   [📞 Call Patient] [💬 Send Message]                  |

TESTS TO COLLECT

   ✓ Test 1: CBC (Complete Blood Count)                 |
     - Sample Type: EDTA (Purple tube)                  |
     - Volume: 3 mL                                     |
     - Collection Notes: Standard                       |
                                                        |
   ✓ Test 2: Thyroid Profile                            |
     - Sample Type: SST (Red top tube)                  |
     - Volume: 5 mL                                     |
     - Collection Notes: Standard                       |
                                                        |
   [Confirm Tests Ready] [Equipment Checklist]          |


[Audio Navigation] [Silent Navigation] [Pause] [Help]
```

Step 3: Arrive at Location & Collect Sample

```
ARRIVAL & COLLECTION
═══════════════════════════════════════════════════════

✓ ARRIVED AT LOCATION
Current Location: 26.1551° N, 50.5540° E
Distance: 50 meters from destination

📍 NEXT STEP: Enter building & call patient

COLLECTION CHECKLIST

   Equipment Ready? [✓ Confirm]                         |
   Patient Details Verified? [✓ Confirm]                |
   Allergies Checked? [✓ Confirm]                       |
   Tests Confirmed? [✓ Confirm]                         |
   Payment Method? Online - Already Paid ✓              |
                                                        |
   [Start Collection] [Issue Encountered]               |


PATIENT VERIFICATION

   Patient ID: 312345678901 (CPR)                       |
   Name: Ahmed Hassan Al-Dosari                         |
   DOB: 15-MAR-1993                                     |
                                                        |
   Ask patient to confirm name & DOB                    |
```

```
[✓ Identity Verified] [Issue / Wrong Patient]    |
```

COLLECTION PROGRESS

```
Test 1: CBC (3mL EDTA) ..................... ⏳  |
Test 2: Thyroid (5mL SST) ................. ⏳  |
                                                 |
Tap below as you collect each test              |
[Collecting CBC...] [Collecting Thyroid...]     |
```

COLLECTION DETAILS

```
Arm Used: [Left ▼] (As preferred)              |
Needle Gauge: [23G ▼]                          |
Collection Time: 14:03 (Automatic)             |
Collection Notes: (Optional)                   |
[_____]                             |
                                               |
Hemolysis Check: ✓ Sample appears clear        |
Tube Mix: ✓ Both tubes inverted 10x            |
                                               |
[✓ Collection Complete]                        |
```

BARCODE SCANNING

```
Scan Sample Barcode (or enter manually):       |
[Camera icon] [Or enter manually]              |
                                               |
Tube 1 Barcode: [📷 Scan] [Manual Entry]        |
Tube 2 Barcode: [📷 Scan] [Manual Entry]        |
                                               |
[✓ All Barcodes Scanned]                       |
```

PAYMENT

```
Amount: 110 BHD                                |
Payment Status: ✓ Already Paid Online          |
Receipt Sent: ✓ Yes (SMS, WhatsApp, Email)     |
                                               |
[Receipt Sent to Patient]                      |
```

[✓ Mark Collection Complete] [Issue / Problem]
```

### Step 4: Handover to Rider

```

HANDOVER TO RIDER
═══
```

📦 SAMPLES READY FOR HANDOVER

Samples Collected:
├─ Test 1: CBC (Barcode: SAM-2025-001234-01) ✓
├─ Test 2: Thyroid (Barcode: SAM-2025-001234-02) ✓

RIDER ASSIGNMENT

```
Rider Name: Ahmed Al-Rashid (RIDER-003)          |
ETA: 15 minutes                                  |
Phone: +973-39876543                             |
Vehicle: Toyota Corolla (Yellow) - KL-12345      |
Destination Lab: Advanced Diagnostics Lab        |
[📍 Track Rider] [📞 Call] [💬 Message]           |
                                                 |
Current Location: 2 km away                      |
[Rider is on the way...]                         |
```

SAMPLE STORAGE

```
Temperature Check: 22°C ✓ Room Temp OK           |
Keep Samples:                                    |
• CBC (EDTA): Room Temperature                   |
• Thyroid (SST): Room Temperature                |
[✓ Samples Properly Stored]                      |
                                                 |
Stability:                                       |
• CBC: Valid for 4 hours at room temp            |
• Thyroid: Valid for 24 hours at room temp       |
```

[Rider Arrived] [Confirm Handover] [Issue]
```

Step 5: Complete Collection Task

```
✓ COLLECTION COMPLETED
========================================================

Summary:
├─ Patient: Ahmed Hassan Al-Dosari ✓
├─ Location: Villa 145, Manama ✓
├─ Tests Collected: 2 (CBC, Thyroid) ✓
├─ Handover to Rider: Ahmed Al-Rashid ✓
├─ Time Taken: 15 minutes (14:00-14:15) ✓
├─ Rating: ⭐⭐⭐⭐⭐ (Given by patient)

NEXT TASK
├─ Patient: Noor Al-Mansoori
├─ Location: Clinic A, Saar
├─ Distance: 5 km (12 min drive)
```

```
├─ ETA: 2:45 PM
└─ [Start Navigation]

TODAY'S PROGRESS
├─ Completed: 9/12
├─ Pending: 3 tasks
├─ Progress: 75% ✓
└─ [View All Tasks]

EARNINGS (Today So Far)
├─ Collections: 9 × 45 BHD = 405 BHD
├─ Rating Bonus: +20 BHD (5-star rating)
├─ Subtotal: 425 BHD
└─ [View Break up Details]

[Start Next Collection] [Take Break] [End Shift]
```

🔴 **Points to Consider**:
- Incident/complication reporting
- Customer feedback capture (inline)
- Equipment damage/lost reporting
- Alternative sample collection (if first attempt fails)
- Stock consumption tracking (real-time deduction)

SECTION 4: PHLEBOTOMIST AND RIDER APP - HOME SCREEN

SELECT ROLE: PHLEBOTOMIST

4.1 RIDER ROLE - HOME SCREEN

```
RIDER SCREEN - HOME
═══════════════════════════════════════════════

☰ TASHEEL DELIVERY              [Ahmed Al-Rashid ▼]

TODAY'S DASHBOARD

┌─────────────────────────────────────────────┐
│ 🟢 STATUS: ONLINE (Since 8:00 AM)           │
│ 📍 CURRENT LOCATION: Central Lab, Downtown   │
│ 🚗 VEHICLE: Toyota Corolla (Yellow) - KL-12345 │
│ ⏱  ON DUTY: 6 hours                          │
│ 📊 DELIVERIES TODAY: 12 completed / 3 pending │
│ 🔋 DEVICE BATTERY: 76%                        │
│ 📡 CONNECTION: ✓ Online                       │
│                                              │
│ [◄ Go Offline] [Settings] [Help]            │
└─────────────────────────────────────────────┘
```

```
PICKUP & DELIVERY QUEUE

┌─────────────────────────────────────────────────┐
│  🟢 CURRENT TASK                                 │
│  ├── Pickup: Villa 145, Manama (From Phlebo)     │
│  ├── Samples: CBC + Thyroid (2 tubes)            │
│  ├── Distance: 100 meters (Already at location)  │
│  ├── Time: 14:15 (On time ✓)                     │
│  ├── [📍 Pickup Location] [Confirm Pickup]       │
│                                                  │
│  🔄 DELIVERY ASSIGNMENT                          │
│  ├── Destination: Advanced Diagnostics Lab       │
│  ├── Address: Lab Location                        │
│  ├── Distance: 3.2 km (8 min drive)              │
│  ├── Status: Ready to Depart                      │
│  └── [Start Navigation]                           │
│                                                  │
│  🔴 NEXT PICKUP                                  │
│  ├── Phlebotomist: Phlebo-032 (Mohammed)         │
│  ├── Location: Clinic A, Saar                     │
│  ├── Distance: 8 km from current                 │
│  └── ETA: 15:00                                   │
└─────────────────────────────────────────────────┘
```

4.2 RIDER DELIVERY WORKFLOW

Step 1: Confirm Pickup
4.2.1 Notification When Samples Ready

Trigger: Phlebotomist marks samples "READY FOR HANDOVER"

```
┌──────────────────────────────────────┐
│  📱 SAMPLES READY FOR PICKUP         │
│                                      │
│  Location: Marina, Dubai             │
│  Samples: 8 ready                    │
│  Phlebotomist: Fatima Ahmed          │
│  Patient: Ahmed Khan                 │
│  Collection Time: 14:30              │
│                                      │
│  [✓ ACCEPT] [✗ DECLINE]             │
└──────────────────────────────────────┘
```

Display Fields:
- Location address & GPS coordinates
- Number of samples ready
- Phlebotomist name + rating
- Primary patient name
- Collection timestamp

- Estimated travel time (with real traffic)

PHASE 4.2.2: HANDOVER VERIFICATION (NEW - CRITICAL)

4.2.2.1 Pre-Handover Sample Summary Screen

```
┌─────────────────────────────────────────────┐
│  📋  EXPECTED SAMPLES FOR HANDOVER           │
│                                              │
│  Phlebotomist: Fatima Ahmed                  │
│  Expected Total: 8 samples                   │
│                                              │
│  Sample List:                                │
│  ☐ HB-001  Hemoglobin                        │
│  ☐ LP-002  Lipid Profile                     │
│  ☐ UA-003  Uric Acid                         │
│  ☐ TS-004  Thyroid Screen                    │
│  ☐ FB-005  Fasting Glucose                   │
│  ☐ CBC-006 Complete Blood Count              │
│  ☐ KF-007  Kidney Function                   │
│  ☐ LF-008  Liver Function                    │
│                                              │
│  [START BARCODE SCANNING]                    │
└─────────────────────────────────────────────┘
```

4.2.2.2 Barcode Scanner Integration (NEW - CRITICAL)

Technology Stack:
- Native camera (iOS: AVFoundation, Android: CameraX)
- ML Kit for CODE128 barcode detection
- Real-time video stream
- Automatic barcode parsing

Scanner UI:
```
┌──────────────────────────────────────┐
│  📷  BARCODE SCANNER                   │
│                                        │
│  [Video Stream - Camera Feed]          │
│  ────────────────────────────────      │
│  Point phone at sample barcode         │
│  Red laser targeting box in center     │
│  ────────────────────────────────      │
│                                        │
│  Samples Scanned: 1/8                  │
│  Status: AWAITING SCAN                 │
│                                        │
│  [⌨ MANUAL ENTRY]   [↵ BACK]          │
└──────────────────────────────────────┘
```

4.2.2.3 Barcode Match Verification Logic (NEW - CRITICAL)

Real-Time Matching Process:

```javascript
// Core verification logic
function verifySampleBarcode(scannedBarcode) {

  // Parse barcode data
  const parsed = parseBarcode(scannedBarcode);

  // Get expected samples from database
  const expected = getExpectedSamples();

  // Search for match
  const match = expected.find(s => s.code === parsed.code);

  if (!match) {
    // UNKNOWN BARCODE - NOT IN EXPECTED LIST
    status = "❌ NOT EXPECTED";
    alert = "This sample not expected in this handover";
    action = "REQUEST MANUAL VERIFICATION FROM PHLEBOTOMIST";
  }
  else if (match.scanned) {
    // ALREADY SCANNED - DUPLICATE
    status = "⚠ DUPLICATE";
    alert = "Sample already scanned once";
    action = "SKIP - ALREADY VERIFIED";
  }
  else {
    // MATCH FOUND - SUCCESS
    status = "✅ MATCH CONFIRMED";
    match.scanned = true;
    match.scanTime = now;
    action = "ACCEPT & ADVANCE TO NEXT";
  }

  return { status, alert, action, match };
}
```

4.2.2.4 Sample Scanning Sequence - All 3 Outcomes

Outcome 1: ✅ Barcode MATCHES Expected

```
┌─────────────────────────────────────┐
│  ✅ BARCODE MATCH VERIFIED          │
│                                      │
│  Expected: HB-001 ✅                │
│  Scanned:  HB-001 ✅                │
│  Status:   MATCH CONFIRMED           │
│                                      │
```

```
Sample 1/8:
Test: Hemoglobin
Patient: Ahmed Khan (PID-12345)
Timestamp: 14:50:30
Vial Integrity: ✓ Good
Temp: 25°C (Safe)


✓ AUTOMATICALLY ADVANCING TO NEXT SAMPLE


Sample 2/8: LP-002 (Lipid Profile)
Ready to scan...
```

Outcome 2: ✖ Barcode MISMATCH

```
 ✖ BARCODE MISMATCH - VERIFICATION FAILED

 Expected: LP-002 (Lipid Profile)
 Scanned:  UA-003 (Uric Acid)
 Status:   MISMATCH DETECTED

 🔴 ACTION REQUIRED:
 The sample you're scanning is not the
 next expected sample.

 LIKELY CAUSES:
 • Samples handed in different order
 • Wrong sample handed by phlebotomist
 • Barcode damaged / unreadable

 [RESCAN SAME SAMPLE]
 [CONTINUE - OVERRIDE]   [GET PHLEBOTOMIST]
```

Outcome 3: 🔴 Barcode NOT FOUND

```
 🔴 UNKNOWN BARCODE DETECTED

 Scanned: XYZ-999 (UNRECOGNIZED)
 Expected: None matching
 Status:   NOT IN SYSTEM

 🔴 CRITICAL:
 This sample was NOT in expected list
 for this handover.

 POSSIBLE CAUSES:
 • Phlebotomist added sample mid-handover
```

```
  • Wrong sample entirely
  • Barcode corrupted / not readable

  [RESCAN]
  [MANUAL ENTRY]
  [ASK PHLEBOTOMIST]
  [REJECT SAMPLE]
```

4.2.2.5 Missing Sample Detection (NEW - CRITICAL)

Scenario: Phlebotomist Forgot Sample LF-008

After scanning 7 samples successfully:

```
  ⚠ SAMPLE COUNT MISMATCH DETECTED

  Samples Expected: 8
  Samples Scanned: 7
  Missing Sample: LF-008 (Liver Function)

  🚨 AUTO-ALERT TRIGGERED:
  • Admin notified immediately
  • Customer notified (test missing)
  • Phlebotomist notified (sample missing)

  RIDER OPTIONS:

  [OPTION 1: PHLEBOTOMIST COLLECTS NOW]
  "Wait while phlebotomist collects missing
   sample, then rescan"

  [OPTION 2: MARK NOT COLLECTED]
  "Continue handover without this sample.
   Phlebotomist will reschedule."

  [OPTION 3: ANOTHER RIDER HAS IT]
  "This sample was given to another rider.
   Document and contact admin."

  [CALL PHLEBOTOMIST]  [CALL ADMIN]
```

PHASE 4.2.3: DIGITAL SIGN-OFF & CHAIN OF CUSTODY (NEW)

4.2.3.1 Sign-Off Screen After All Samples Verified

```
```

```
✅ ALL 8 SAMPLES VERIFIED

Summary:
✅ HB-001 (Hemoglobin)
✅ LP-002 (Lipid Profile)
✅ UA-003 (Uric Acid)
✅ TS-004 (Thyroid Screen)
✅ FB-005 (Fasting Glucose)
✅ CBC-006 (Complete Blood Count)
✅ KF-007 (Kidney Function)
✅ LF-008 (Liver Function)

All barcodes matched ✅
Sample count: 8/8 ✅

READY FOR SIGN-OFF

 [PROCEED TO SIGNATURES]  [BACK TO SCAN]
```

4.2.3.2 Digital Signature Capture (NEW)

Phlebotomist Signs First:

```
   ✋ PHLEBOTOMIST SIGNATURE REQUIRED

 Name: Fatima Ahmed
 Location: Marina, Dubai
 Timestamp: 14:50:45 UTC
 GPS: 25.1889°N, 55.2743°E

 Options:
 [ ] Fingerprint (if device has sensor)
 [✔] Signature Drawing
 [ ] PIN Code

   ┌─────────────────────────────┐
   │  SIGNATURE DRAWING AREA      │
   │  Sign with finger            │
   │                              │
   │                              │
   │                              │
   └─────────────────────────────┘

 [✓ CONFIRM]  [✗ CLEAR]  [📷 PHOTO]
```

Then Rider Signs:

```
┌─────────────────────────────────────────┐
│   ✋  RIDER SIGNATURE REQUIRED           │
│                                          │
│   Name: Mohammed Hassan                  │
│   Location: Marina, Dubai                │
│   Timestamp: 14:50:50 UTC                │
│   GPS: 25.1889°N, 55.2743°E              │
│                                          │
│   You are accepting:                     │
│   • 8 samples from Fatima Ahmed          │
│   • All barcodes matched ✓               │
│   • All samples in good condition ✓      │
│   • Temperature maintained ✓             │
│   • GPS location verified ✓              │
│                                          │
│   ┌───────────────────────────────┐      │
│   │  SIGNATURE DRAWING AREA        │      │
│   │  Sign with finger              │      │
│   │                                │      │
│   │                                │      │
│   │                                │      │
│   └───────────────────────────────┘      │
│                                          │
│   [✓ CONFIRM HANDOVER]  [✗ CLEAR]        │
└─────────────────────────────────────────┘
```

4.2.3.3 Complete Chain of Custody Record Created

```
CHAIN OF CUSTODY - HANDOVER TRANSACTION
═══════════════════════════════════════════════

Transaction ID: HOT-20260105-001
Date: January 5, 2026
Location: Marina, Dubai (GPS Verified)

HANDOVER FROM (Phlebotomist):
  Name: Fatima Ahmed
  Employee ID: PHB-123
  Signature: [Digital Signature Image]
  Timestamp: 14:50:45 UTC
  GPS: 25.1889°N, 55.2743°E
  Biometric: [Fingerprint/PIN Optional]

HANDOVER TO (Rider):
  Name: Mohammed Hassan
  Rider ID: RID-456
  Signature: [Digital Signature Image]
  Timestamp: 14:50:50 UTC
  GPS: 25.1889°N, 55.2743°E
  Biometric: [Fingerprint/PIN Optional]
```

```
SAMPLES HANDED OVER:
  Total: 8 samples
  HB-001 (Hemoglobin) ✅ Verified
  LP-002 (Lipid Profile) ✅ Verified
  UA-003 (Uric Acid) ✅ Verified
  TS-004 (Thyroid Screen) ✅ Verified
  FB-005 (Fasting Glucose) ✅ Verified
  CBC-006 (Complete Blood Count) ✅ Verified
  KF-007 (Kidney Function) ✅ Verified
  LF-008 (Liver Function) ✅ Verified

VERIFICATION SUMMARY:
  Barcodes Scanned: 8/8
  Barcodes Matched: 8/8
  Samples Expected: 8
  Samples Received: 8
  Status: ✅ 100% MATCH

ENVIRONMENTAL CONDITIONS:
  Temperature: 25°C (Safe Range ✓)
  Humidity: 45% (Acceptable ✓)
  Sample Condition: All vials intact ✓
  Packaging: Secure & undamaged ✓
  Photo Evidence: Attached ✓

AUDIT TRAIL:
  Transaction Created: 2026-01-05 14:50:50 UTC
  Status: HANDOVER COMPLETE
  Database Entry: Logged ✓
  Signatures: Both captured ✓
  Photos: Attached (8 images) ✓
  GPS Data: Recorded ✓
  Temperature: Logged ✓

========================================================
```

Captured in Database:
- handover_id (UUID)
- phlebotomist_id, rider_id
- samples_expected, samples_scanned, samples_matched
- timestamp_start, timestamp_end
- location_gps, location_address
- temperature, humidity
- signatures (both digital images)
- barcode_scan_log (JSON array of all scans)
- exceptions, manual_overrides
- chain_of_custody_log (complete audit trail)

PHASE 4.2.4: TRANSPORT TO COLLECTION CENTER (UPDATED)

4.2.4.1 In-Transit Status with Real-Time Monitoring

```
┌──────────────────────────────────────────────┐
│  📦  SAMPLES IN TRANSIT                        │
│                                                │
│  Current Status: HEADING TO CENTER            │
│  📍 Current Location: Dubai Marina             │
│  🎯 Destination: Collection Center (Downtown)  │
│  Distance: 8.3 km                             │
│  ETA: 15:15                                    │
│  Estimated Time: 25 minutes                    │
│                                                │
│  SAMPLES SECURE:                               │
│  ✓ 8 samples in transit                        │
│  ✓ All handover verified                       │
│  ✓ Chain of custody established                │
│                                                │
│  MONITORING:                                   │
│  GPS Tracking: ✓ Active (updates every 30s)    │
│  Temperature: 25°C ✓ (Safe: 18-28°C)           │
│  Speed: 45 km/h                                │
│  Route: Optimized                              │
│                                                │
│  [MAP VIEW] [CALL OPERATOR] [REPORT ISSUE]     │
│                                                │
└──────────────────────────────────────────────┘
```

4.2.4.2 Real-Time GPS

Background Tracking:
- GPS location: Every 30 seconds
- Speed monitoring: Continuous
- Route optimization: Real-time alerts

Alerts Triggered If:
- 🔴 Route deviation → "Off optimal route, check destination"
- 🔴 Speed > 80 km/h → "Slow down, samples in transit"
- 🔴 Stop > 5 minutes → "Sample exposure risk, resume delivery"

PHASE 4.2.5: CENTER RECEIPT & VERIFICATION (UPDATED)

4.2.5.1 Center Staff Receipt Scanning

```
┌──────────────────────────────────────────────┐
│  📥  SAMPLE RECEIPT - COLLECTION CENTER        │
│                                                │
│  Rider: Mohammed Hassan (RID-456)             │
│  Arrival: 15:15:20                             │
│  Samples Expected: 8                           │
│                                                │
│  [📱 SCAN BARCODE]                             │
```

```
 Scanning Progress:
 ✅ HB-001  (Hemoglobin) - 14:50
 ✅ LP-002  (Lipid Profile) - 14:52
 ✅ UA-003  (Uric Acid) - 14:54
 ⏳ TS-004  (Thyroid Screen) - SCANNING...
 ☐ FB-005  (Fasting Glucose) - PENDING
 ☐ CBC-006 (Complete Blood Count) - PENDING
 ☐ KF-007  (Kidney Function) - PENDING
 ☐ LF-008  (Liver Function) - PENDING

 Status: 4/8 RECEIVED

 [CONTINUE SCANNING]
```

4.2.5.2 Center Staff Digital Sign-Off

```
 ✅ ALL SAMPLES RECEIVED & VERIFIED

 Receipt Summary:
 Total Received: 8/8 ✅
 Barcodes Scanned: 8/8 ✅
 All Matched: YES ✅
 Timestamp: 15:16:30

 QUALITY CHECK:
 ☑ All vials intact
 ☑ No leaks detected
 ☑ Labels readable
 ☑ Temperature maintained (25°C)
 ☑ All samples in good condition

 Status: ✅ RECEIPT COMPLETE
 Next: Lab Assignment & Dispatch

 [CENTER STAFF SIGN-OFF]
```

PHASE 4.2.6: LAB ASSIGNMENT & DISPATCH (UPDATED)

4.2.6.1 Lab Routing Logic

Today's 8 samples go to 3 different labs:

```
LAB ROUTING - TODAY'S 8 SAMPLES:
```

```
American Hospital (INTEGRATED - LIS Connected):
   • HB-001 (Hemoglobin)
   • CBC-006 (Complete Blood Count)
   • KF-007 (Kidney Function)
   → Total: 3 samples
   → Integration: LIS Connected ✅
   → Action: Auto-sync via API (no reprinting)

Zaki Laboratory (NON-INTEGRATED - Manual Entry):
   • LP-002 (Lipid Profile)
   • TS-004 (Thyroid Screen)
   • UA-003 (Uric Acid)
   → Total: 3 samples
   → Integration: Manual Portal Entry ❌
   → Action: Portal entry + Barcode reprint

Path Lab (NON-INTEGRATED - Manual Entry):
   • FB-005 (Fasting Glucose)
   • LF-008 (Liver Function)
   → Total: 2 samples
   → Integration: Manual Portal Entry ❌
   → Action: Portal entry + Barcode reprint
```

4.2.6.2 Integrated Lab Dispatch (LIS API Sync)

For American Hospital (Already Connected):

```
SYSTEM AUTO-SYNC (No Manual Work)
═══════════════════════════════════════════

Step 1: Identify Integrated Samples
   • HB-001 → American Hospital (INTEGRATED)
   • CBC-006 → American Hospital (INTEGRATED)
   • KF-007 → American Hospital (INTEGRATED)
   Status: Ready for API Sync ✅

Step 2: Auto-Format Data for Lab's LIS
   Sample data retrieved from database

Step 3: Send to Lab's LIS API
   Endpoint: POST https://lab-api.americanhospital.ae/samples/register
   Status: 📤 TRANSMITTED ✅

Step 4: Lab LIS Confirmation
   Response: ACCEPTED
   Status: 📥 CONFIRMED ✅

Step 5: Samples Pre-Registered in Lab Queue
   Lab staff see samples already in their queue
   NO manual entry needed at lab
   NO reprinting needed
   SAME Tasheel barcode used throughout
```

FAST handoff expected

Result: ✅ All 3 samples pre-registered in Lab's LIS
```

#### 4.2.6.3 Non-Integrated Lab Dispatch (Manual Portal Entry)

**For Zaki Laboratory (Portal Manual Entry):**

```
MANUAL ENTRY WORKFLOW
═══════════════════════════════════════════════

Step 1: Center Staff Logs into Vendor Portal
   Portal: https://vendor.zakilab.ae
   Login: tasheel_center_1
   Status: LOGGED IN ✅

Step 2: Manual Data Entry for Sample 1 (LP-002)
   Field: Test Code: LAB-LP-2026-0142
   Field: Patient Name: Ahmed Khan
   Field: Test Type: Lipid Profile
   ... [continue for all fields] ...
   Status: ✓ SAVED TO PORTAL

Step 3: Barcode Reprinting (NEW VENDOR FORMAT)
   Printer: Canon LBP8360
   Label Format: CODE128 (Vendor format)
   Print: LAB-LP-2026-0142 (Lipid Profile)
   Print: LAB-TS-2026-0143 (Thyroid Screen)
   Print: LAB-UA-2026-0144 (Uric Acid)
   Status: ✓ 3 LABELS PRINTED

Step 4: Remove Old & Affix New Barcodes
   Vial 1: Remove LP-002, Affix LAB-LP-2026-0142
   Vial 2: Remove TS-004, Affix LAB-TS-2026-0143
   Vial 3: Remove UA-003, Affix LAB-UA-2026-0144
   Status: ✓ ALL RELABELED

Step 5: Another Rider Dispatches to Lab
   Rider takes samples with new vendor barcodes
   Lab receives and manually registers
   Lab begins testing with new barcode
   Status: ✓ DISPATCHED

Result: ✓ Samples ready for lab with new barcodes
```

4.2.6.4 Dispatch Manifests (Updated)

Manifest for Integrated Lab (Pre-registered):

```
VENDOR DISPATCH MANIFEST
```

```
════════════════════════════════════════

Destination: American Hospital
Integration: ✅ LIS CONNECTED (Pre-registered)
Samples: 3 (with ORIGINAL Tasheel barcodes)

Samples:
1. HB-001 (Hemoglobin) ✅ Pre-registered in Lab's LIS
2. CBC-006 (Complete Blood Count) ✅ Pre-registered
3. KF-007 (Kidney Function) ✅ Pre-registered

Status in Lab: Already in testing queue
Reprinting: NO (same original barcodes)
Manual Entry: NO (already synced via API)
Fast Process: YES (pre-registered)

Rider: Saqib (RID-456)
Pickup: 15:30 | ETA at Lab: 16:00
```

Manifest for Non-Integrated Lab (Reprinted):

```
VENDOR DISPATCH MANIFEST
════════════════════════════════════════

Destination: Zaki Laboratory
Integration: ❌ NOT CONNECTED (Manual Entry)
Samples: 3 (with NEW vendor barcodes)

Samples:
1. LAB-LP-2026-0142 (Lipid Profile) [Original: LP-002]
2. LAB-TS-2026-0143 (Thyroid Screen) [Original: TS-004]
3. LAB-UA-2026-0144 (Uric Acid) [Original: UA-003]

Status in Lab: Pending manual registration
Reprinting: YES (new vendor format applied)
Manual Entry: Required upon receipt
Process: Normal (manual handling)

Rider: Saqib (RID-456)
Pickup: 15:35 | ETA at Lab: 16:05
```

📊 PROCESS COMPARISON TABLE (OLD vs NEW)

Aspect	Old Process	New Process (v2.0)
Handover Verification	❌ None	✅ Real-time barcode scanning (8/8 match)
Missing Samples	Discovered at center (too late)	Caught instantly at phlebotomist ✅

Sample Accuracy	97-98%	100% (barcode verified) ✅
Chain of Custody	Minimal	Complete (GPS, temp, signatures) ✅
Verification Points	1 (center only)	3 (handover, transport, center) ✅
Temperature Monitoring	❌ None	✅ Every 5 minutes with alerts
GPS Tracking	❌ None	✅ Every 30 seconds
Digital Signatures	❌ None	✅ Both parties sign
Missing Sample Alerts	Manual discovery	Automatic, instant ✅
Lab Integration	Manual for all labs	Auto-sync for integrated labs ✅
Barcode Reprinting	Not needed	Only for non-integrated labs ✅
Error Detection	Late (after center)	Early (during handover) ✅
Sample Loss Rate	2-3%	<0.5% (near zero) ✅
Audit Trail	20%	100% ✅
Time to Lab	60-90 minutes	45-60 minutes ✅

🔧 TECHNICAL IMPLEMENTATION DETAILS

Database Tables Required

```sql
-- Sample Handover Transactions
CREATE TABLE sample_handover_transactions (
  handover_id UUID PRIMARY KEY,
  phlebotomist_id INT,
  rider_id INT,
  samples_expected INT,
  samples_scanned INT,
  samples_matched INT,
  timestamp_start TIMESTAMP,
  timestamp_end TIMESTAMP,
  location_gps POINT,
  location_address TEXT,
  temperature DECIMAL(5,2),
  humidity DECIMAL(5,2),
  phlebotomist_signature BLOB,
  rider_signature BLOB,
  exceptions JSON,
  chain_of_custody_log JSON
);

-- Barcode Scans
CREATE TABLE barcode_scans (
  scan_id UUID PRIMARY KEY,
  handover_id UUID,
  barcode_expected VARCHAR(100),
  barcode_scanned VARCHAR(100),
  match_status ENUM('MATCH', 'MISMATCH', 'NOT_FOUND'),
  scan_timestamp TIMESTAMP,
  manual_override BOOLEAN
);
```

```sql
-- Sample Dispatch
CREATE TABLE sample_dispatch (
  dispatch_id UUID PRIMARY KEY,
  lab_id INT,
  lab_name VARCHAR(255),
  integration_status ENUM('INTEGRATED', 'NON_INTEGRATED'),
  samples_list JSON,
  vendor_portal_entry BOOLEAN,
  reprinted_barcodes JSON,
  rider_id INT,
  delivery_timestamp TIMESTAMP,
  proof_of_delivery_photo BLOB,
  proof_of_delivery_signature BLOB
);
```

App Features Required

Phlebotomist App
- [ ] "Prepare for Handover" checklist screen
- [ ] "Mark Ready for Handover" button
- [ ] Digital signature capture
- [ ] Handover status tracking

Rider App (MAJOR UPDATES)
- [ ] Barcode scanner (camera integration)
- [ ] Real-time barcode matching
- [ ] Sample count tracker (1/8, 2/8, etc.)
- [ ] Missing sample detection UI
- [ ] Digital signature capture
- [ ] GPS tracking (every 30 seconds)
- [ ] Temperature monitoring (every 5 minutes)
- [ ] Real-time alerts on violations
- [ ] Transport status display
- [ ] Proof of delivery (photo + signature)

Center Staff Portal
- [ ] Sample receipt scanning
- [ ] Lab assignment interface
- [ ] Vendor portal integration
- [ ] Barcode printing control
- [ ] Manifest generation
- [ ] Rider task assignment

Admin Dashboard
- [ ] Real-time handover tracking
- [ ] Missing sample alerts
- [ ] Temperature monitoring dashboard
- [ ] GPS tracking visualization
- [ ] Handover exception reports
- [ ] Chain of custody audit viewer
- [ ] Quality metrics (sample loss %, barcode match %)

🎯 CRITICAL CHECKPOINTS FOR DEVELOPERS

Before implementation, confirm:

- [ ] Barcode scanner can read CODE128 format reliably
- [ ] Real-time matching logic handles edge cases (duplicate barcodes, typos)
- [ ] GPS tracking battery drain acceptable for long shifts
- [ ] Biometric signature capture works across iOS/Android
- [ ] Database can handle 100+ handovers/day
- [ ] API integration ready for lab systems
- [ ] Offline functionality if network drops during handover
- [ ] Photo upload size/quality optimized for bandwidth

SECTION 5: LAB PARTNER PORTAL (VENDOR DASHBOARD)

5.1 LAB PORTAL - HOME SCREEN

```
LAB PORTAL - ADVANCED DIAGNOSTICS LAB
═══════════════════════════════════════════════════

Welcome, Dr. Hassan | [Settings] [Logout]

TODAY'S DASHBOARD

┌─────────────────────────────────────────────────┐
│  SAMPLES RECEIVED TODAY: 35                       │
│  TESTS PENDING: 12 (under processing)             │
│  TESTS COMPLETED: 23                              │
│  REPORTS UPLOADED: 20                             │
│  PENDING UPLOAD: 3                                │
│                                                  ││
│  LAB UTILIZATION: 78% (Good)                      │
│  QUALITY ALERTS: 0 (No issues)                    │
│  SLA COMPLIANCE: 100% (On track)                  │
└─────────────────────────────────────────────────┘

SAMPLES RECEIVED (QUEUE)

┌─────────────────────────────────────────────────┐
│  🟢   SAMPLES READY FOR PROCESSING               │
│                                                  │
│  1. CBC - Ahmed Hassan (SAM-2025-001234-01) ✓    │
│     Received: 14:23 | Priority: Normal           │
│     [Start Processing]                           │
│                                                  │
│  2. Thyroid - Ahmed Hassan (SAM-2025-001234-02) ✓│
│     Received: 14:23 | Priority: Normal           │
│     [Start Processing]                           │
│                                                  │
│  3. Lipid Panel - Fatima Ali (SAM-2025-001235-01) │
```

```
        Received: 14:20 | Priority: Normal            |
       [Start Processing]                             |
                                                      |
                                                      |
   [View All Samples] [Bulk Processing]               |
```

REPORTS PENDING UPLOAD
```
   🟡  WAITING FOR RESULTS ENTRY                      |
                                                      |
   1. CBC - Noor Al-Mansoori                          |
      Sample Received: 13:45                          |
      Est. Ready: 14:45 (By 15:45 TAT)                |
      [Enter Results] [View Sample]                   |
                                                      |
   2. Comprehensive Panel - Mohammed Hassan           |
      Sample Received: 13:30                          |
      Est. Ready: 14:30 (By 14:30 TAT)                |
      [Enter Results] [View Sample]                   |
```

[View Invoices] [Payment Status] [Settings]
```

5.2 LAB PORTAL - SAMPLE WORKFLOW

```
SAMPLE MANAGEMENT - WORKFLOW
════════════════════════════════════════════════════

[Sample List] [Bulk Upload] [Reports] [Settings]
```

Sample ID	Patient	Test	Status
SAM-2025-001234	Ahmed H.	CBC	🟢 Ready Processing
SAM-2025-001234	Ahmed H.	TSH	🟢 Ready Processing
SAM-2025-001235	Noor A.	LP	🟡 Results Pending Upload

```
[View Details] [Upload Results] [Mark Complete] [Issues]
```

Report Upload Process

```

```
UPLOAD TEST RESULTS
═══

Sample: CBC (SAM-2025-001234-01)
Patient: Ahmed Hassan Al-Dosari
Analyzer: Sysmex XN-1000

RESULT ENTRY

┌─────────────────────┬──────────┬────────┬─────────────┐
│ Test Component   │ Result   │ Unit   │ Ref Range   │
├─────────────────────┼──────────┼────────┼─────────────┤
│ WBC   │ 7.2   │ K/µL   │ 4.5-11.0   │
│ RBC   │ 4.9   │ M/µL   │ 4.5-5.9   │
│ Hemoglobin   │ 14.5   │ g/dL   │ 13.5-17.5   │
│ Hematocrit   │ 43.2   │ %   │ 41-53   │
│ MCV   │ 88   │ fL   │ 80-100   │
│ Platelets   │ 250   │ K/µL   │ 150-400   │
│ [+ Add More Fields] │   │   │   │
└─────────────────────┴──────────┴────────┴─────────────┘

QUALITY ASSURANCE

┌──┐
│ Equipment: Sysmex XN-1000 ✓   │
│ Calibration: OK (Last: Today 08:00) ✓   │
│ QC Status: PASSED ✓   │
│ Analyzer Notes: Sample quality: Good   │
│ [✓ QA Verified]   │
└──┘

INTERPRETATION (Optional)

┌──┐
│ Clinical Comments: (Optional)   │
│ [_____]   │
│   │
│ Reviewed By: [Dr. Hassan ▼]   │
│ Approval Date: 02-JAN-2026 14:40   │
│   │
│ [✓ Submit Results]   │
└──┘
```

🔴 **Points to Consider **:
- Electronic signature capture (LIS integration)
- Bulk result import (Excel/CSV upload)
- Critical value notification (alert if result critical)

---

---

# SECTION 6: SMART REPORT GENERATION ENGINE

---

## 6.1 SMART REPORT ARCHITECTURE

### Data Flow for Smart Report Creation

```
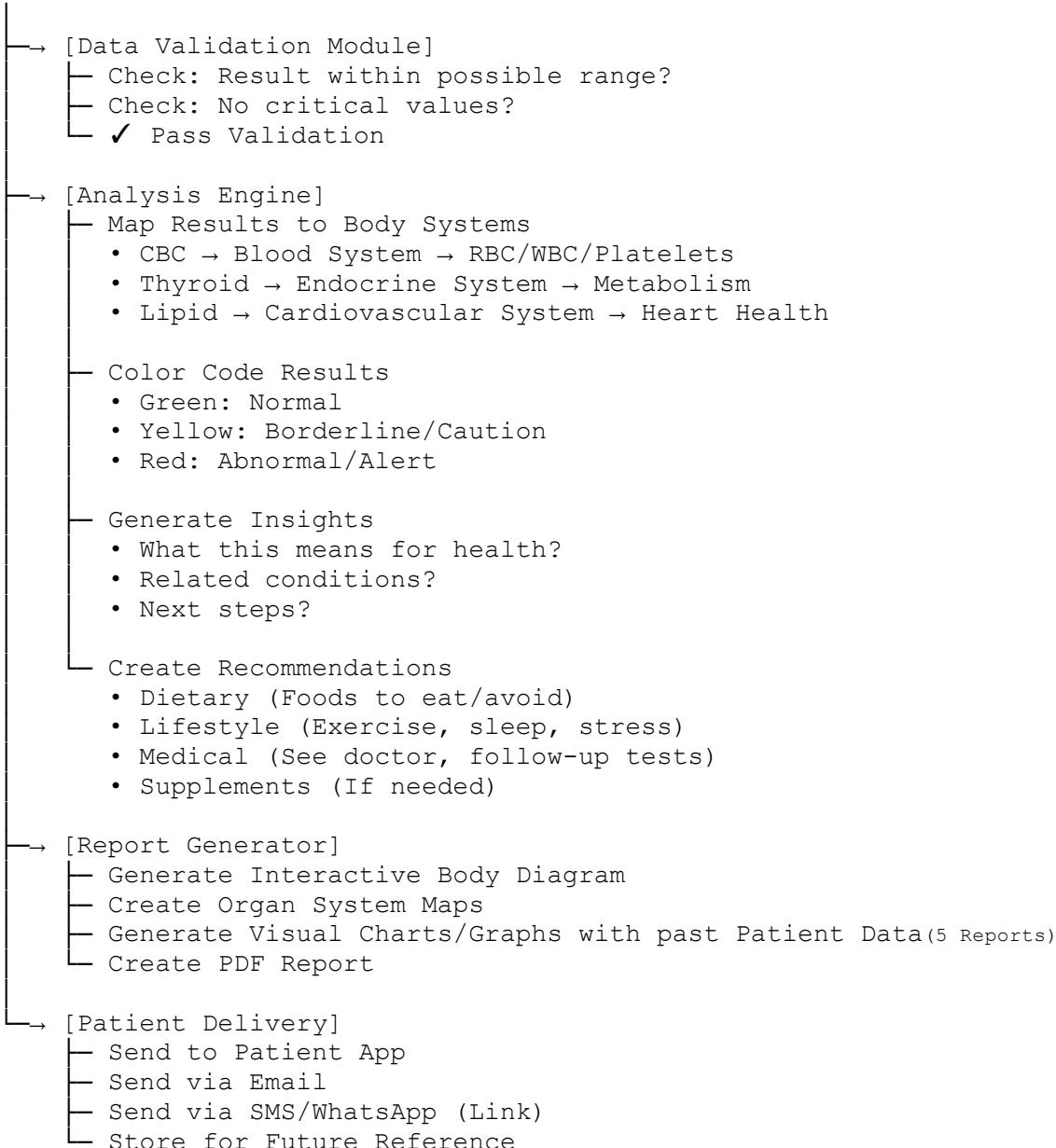SMART REPORT DATA PIPELINE
═══════════════════════════════════════════════════════

LAB TEST RESULT
        │
        ├─→ [Data Validation Module]
        │   ├─ Check: Result within possible range?
        │   ├─ Check: No critical values?
        │   └─ ✓ Pass Validation
        │
        ├─→ [Analysis Engine]
        │   ├─ Map Results to Body Systems
        │   │   • CBC → Blood System → RBC/WBC/Platelets
        │   │   • Thyroid → Endocrine System → Metabolism
        │   │   • Lipid → Cardiovascular System → Heart Health
        │   │
        │   ├─ Color Code Results
        │   │   • Green: Normal
        │   │   • Yellow: Borderline/Caution
        │   │   • Red: Abnormal/Alert
        │   │
        │   ├─ Generate Insights
        │   │   • What this means for health?
        │   │   • Related conditions?
        │   │   • Next steps?
        │   │
        │   └─ Create Recommendations
        │       • Dietary (Foods to eat/avoid)
        │       • Lifestyle (Exercise, sleep, stress)
        │       • Medical (See doctor, follow-up tests)
        │       • Supplements (If needed)
        │
        ├─→ [Report Generator]
        │   ├─ Generate Interactive Body Diagram
        │   ├─ Create Organ System Maps
        │   ├─ Generate Visual Charts/Graphs with past Patient Data(5 Reports)
        │   └─ Create PDF Report
        │
        └─→ [Patient Delivery]
            ├─ Send to Patient App
            ├─ Send via Email
            ├─ Send via SMS/WhatsApp (Link)
            └─ Store for Future Reference
```

Smart Report UI Components

```
```

SMART REPORT - INTERACTIVE INTERFACE
══

```
BODY SYSTEM DIAGRAM (CLICKABLE)

              🧠  BRAIN/NERVES
              (Not tested in this panel)

          🫀 🖤 HEART/CARDIOVASCULAR SYSTEM
        Status: 🟢 NORMAL
        (Related to Lipid Panel results)

          🫁 LUNGS/RESPIRATORY
        Status: 🟢 NORMAL
        (Oxygen capacity from Hemoglobin)

        🔴 BLOOD SYSTEM
        Status: 🟢 NORMAL
        (CBC Test Results)
        [Click for Details] →

          🏥 IMMUNE SYSTEM
        Status: 🟢 NORMAL
        (WBC Count OK)
        [Click for Details] →

          ⚙ DIGESTIVE/METABOLIC
        Status: 🟡 CAUTION
        (Glucose/Liver enzymes borderline)
        [Click for Details] →

          🧬 HORMONAL/ENDOCRINE
        Status: 🟢 NORMAL
        (Thyroid TSH within range)
        [Click for Details] →
```

6.2 ORGAN SYSTEM DETAIL CARDS

Example: Blood System Details

```
BLOOD SYSTEM - DETAILED ANALYSIS
════════════════════════════════════════════════════════

[Back to Body Map]

Test: Complete Blood Count (CBC)
Date: 02-JAN-2026 | Lab: Advanced Diagnostics

OVERALL STATUS: 🟢 HEALTHY BLOOD PROFILE
```

▓▓▓▓▓▓▓▓ 100% NORMAL (All parameters within range)

KEY FINDINGS

```
✓ White Blood Cells: 7.2 K/µL (Normal 4.5-11.0)
  Meaning: Immune system healthy, no active
  infection or immune disorder detected

✓ Red Blood Cells: 4.9 M/µL (Normal 4.5-5.9)
  Meaning: Good oxygen-carrying capacity, not
  anemic. Sufficient RBCs for body needs

✓ Hemoglobin: 14.5 g/dL (Normal 13.5-17.5)
  Meaning: Oxygen-carrying protein is adequate

✓ Platelets: 250 K/µL (Normal 150-400)
  Meaning: Blood clotting ability is normal

✓ Hematocrit: 43.2% (Normal 41-53%)
  Meaning: Red blood cells occupy healthy %
  of blood volume
```

RELATED CONDITIONS (What to Watch For)

```
✓ No Anemia (Iron deficiency, B12 deficiency)
✓ No Infection (Bacterial, viral, or other)
✓ No Leukemia or Blood Cancers
✓ No Bleeding Disorders
✓ No Immune System Disorders
```

RECOMMENDATIONS

```
🥗 NUTRITION
  Foods to Include:
  • Red meat, poultry, fish (Iron for RBC)
  • Beans, lentils, spinach (Plant-based iron)
  • Vitamin C (Orange, tomato) aids iron
  • absorption
  • Nuts, seeds (Healthy fats)

💪 EXERCISE
  • 30 min cardio 5x/week (aerobic exercise)
  • 2x/week strength training
  • Improves red blood cell production

💤 SLEEP
  • 7-9 hours/night
  • Aids immune cell production

💧 HYDRATION
  • Minimum 8 glasses water daily
  • Helps oxygen transport
```

```
|                                                           |
  🧘  STRESS MANAGEMENT                                     |
     • Chronic stress affects WBC count                    |
     • Practice meditation or yoga                          |
                                                           |
  📅  FOLLOW-UP                                             |
  17  • Next CBC recommended in: 1 year                    |
     • Earlier if symptoms develop                          |
     • If more frequent testing needed, consult MD    |
```

COMPARISON WITH PREVIOUS RESULTS

```
Last Test (08-DEC-2025):                                   |
• WBC: 7.0 K/µL → 7.2 K/µL (↑ Slight increase)     |
• RBC: 4.8 M/µL → 4.9 M/µL (↑ Slight increase)     |
• Hemoglobin: 14.3 → 14.5 (↑ Improving)            |
                                                           |
TREND: ✓ Stable and improving                       |
No concerns about changes                               |
```

[💬 Ask Doctor] [📊 View Chart] [🔗 Learn More]
```

🔴 **Points to Consider** (For Smart Report):

Component	Required?	Current Status	Notes
Interactive body diagram	✓ Yes		Must create SVG with clickable organs
Color coding logic	✓ Yes		Need Green/Yellow/Red rules per test
Personalized insights	✓ Yes		Generate based on patient age/gender
Food recommendations	✓ Yes		Database of foods for each condition
Exercise recommendations	✓ Yes		Tailored to patient age/fitness level
Lifestyle advice	✓ Yes		Sleep, stress, hydration guidance
Medication interactions		**If patient has med history**	**- Future Module (not in current Scope)**
Trend analysis	✓ Yes		Compare last 5 results, show charts
Doctor consultation link	🟠 Suggested	Integrate telemedicine booking
Supplement recommendations	🟠 Suggested		Based on deficiencies detected

---

SECTION 7: CRITICAL SUMMARY

🔴 HIGH PRIORITY (Must Include)

Feature	Module	Impact	Effort
Smart report body diagram	All Apps	High - Core feature	
Color coding (Green/Yellow/Red)	Reports	High - Visual clarity	
Personalized health insights	Reports	High - Competitive advantage	60 hrs
Phlebotomist certification tracking	Admin	High - Legal requirement	
Audit logging (complete)	Admin	High - Compliance	
Real-time stock tracking	Admin	High - Operations	
Document expiry alerts	Admin	High - Regulatory	
Insurance integration	**Patient App**	**Medium – Revenue- Future Module not in current scope**	
Payment plan options	Patient App	Medium – Conversion- **Future Module not in current scope (EMI Scheme)**	
Lab LIS integration	Lab Portal	High - Automation	
Delta checking (result validation)	Lab Portal	High - Quality	
Test bundle discounts	Patient App	Medium - Revenue	

🟡 MEDIUM PRIORITY (Should Include)

Feature	Module	Impact	Effort
Custom report builder	Admin	Medium	
Power BI dashboard integration	Admin	Medium	
Scheduled report distribution	Admin	Medium	
Real-time metrics alerts	Admin	Medium	
Video tutorials (for tests)	Patient App	Medium - **Future Module not in current scope**	
Test recommendations (related tests)	Patient App	Medium	
Wearable data integration	Patient App	Medium	
CRM leads/segment automation	Admin	Medium	
Loyalty program management	Admin	Medium **Future Module not in current scope**	
Phlebotomist training module	Admin	Medium - **Future Module not in current scope**	

🟠 Low (Phase 2+)

Feature	Module	Impact	Effort
Teleconsultation integration	App	Low	
Mobile PharmacyServices	Platform	Low **Future Module not in current scope**	
Home nursing services	Platform	Low **Future Module not in current scope**	
Subscription health plans	Platform	Low	**Future Module not in current scope**
Cold chain logistics	Rider	Low	**Future Module not in current scope**
Predictive health analytics	Admin	Low **Future Module not in current scope**	

| White-label app option | Platform | Low | **Future Module not in current scope**

SUMMARY OF FEW REQUIREMENTS TO KEEP IN MIND WHICH IS ALREADY INCLUDED IN List PROVIDED.

By Module:

Admin Dashboard:
- 🔴 Advanced filtering & custom reports
- 🔴 Real-time alert system
- 🔴 Phlebotomist certification tracking with auto-renewal alerts
- 🔴 Equipment/stock management with low-stock alerts
- 🔴 Vendor reconciliation module
- 🟡 CRM automation (segment patients, send targeted campaigns)
- 🟡 Insurance claims management- Future Module

Patient App:
- 🔴 Smart report interactive body diagram
- 🔴 Personalized health insights & recommendations
- 🟡 Test bundle/package options
- 🟡 Prescription upload & test suggestions- Future Module
- 🟡 Wearables integration
- 🟠 Telemedicine booking- Future Module
- 🟠 Pharmacy integration- Future Module
- 🟠 Loyalty program - Future Module

Phlebotomist App:
- 🔴 Photo capture for incident reporting
- 🔴 Real-time stock consumption tracking
- 🔴 Incident/complication reporting
- 🟡 Performance feedback (Online ratings)
- 🟡 Earnings tracking & Amount in hand visibility

Lab Portal:
- 🔴 LIS system integration (automated result entry)
- 🔴 Delta checking (flag unusual result changes)
- 🔴 Critical value alerts
- 🔴 Electronic signature capture
- 🟡 Bulk result import (Excel/CSV)
- 🟡 Quality control tracking

System-Wide:
- 🔴 Complete audit logging (every transaction)
- 🔴 Data encryption (at rest & in transit)
- 🔴 GDPR/Privacy compliance documentation
- 🟡 API rate limiting & security
- 🟡 Backup & disaster recovery procedures