Mediconnect MVP: Technical Requirements and Product Definition

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Executive Summary

This document consolidates the comprehensive technical and functional requirements for the Minimum Viable Product (MVP) of the Mediconnect platform. The primary objective is to establish a build-ready Product Requirements Document (PRD) foundation for the upcoming greenfield development cycle. The target audience for this report includes the product managers and engineering leads responsible for executing the platform's initial build. The development is constrained by a three-month timeline, targeting a phased pilot launch in Nairobi, Kenya, scaling from an initial 500 users to 1,000, and subsequently to 10,000 active users. The platform is architected around a Healthcare-as-a-Service (HaaS) model, positioning a General Practitioner (GP) as the primary entry point for all patient care. The technical strategy mandates a mobile-first application that leverages a hybrid communication model: a native in-app experience for persistent chat and service navigation, supplemented by the WhatsApp platform for critical real-time interactions, specifically user authentication and audio/video consultations. This approach is designed to meet users on a familiar platform while maintaining a controlled, secure, and scalable service delivery ecosystem.

1. Core Product Principles & Operating Model

The foundational architecture and user experience of Mediconnect are governed by a set of core principles that directly inform the operating model. These principles are designed to ensure a safe, effective, and scalable healthcare delivery system tailored to the specific constraints and opportunities of the initial pilot market.

A central tenet of the platform is its **Healthcare-as-a-Service (HaaS) Model**. Unlike a conventional marketplace that connects patients with a broad, uncurated selection of providers, Mediconnect functions as a direct service provider. The platform orchestrates the entire patient journey, with the General Practitioner acting as the central coordinator of care. Patients do not browse or select specialists, pharmacies, or diagnostic centers from an open directory. Instead, the assigned GP assesses the patient's needs and presents a limited, curated set of vetted options for subsequent steps, such as a specialist referral or pharmacy fulfillment. This model prioritizes clinical governance, quality control, and a simplified, guided experience for the patient, reducing cognitive load and decision fatigue while ensuring adherence to platform-defined care pathways. All partner entities, including specialists, pharmacies, and labs, are onboarded into a closed network, operating under specific protocols defined by Mediconnect to guarantee a consistent standard of care and data handling.

The initial deployment will be a **Targeted Pilot Program** exclusively within Nairobi, Kenya. This focused geographic scope allows for controlled testing and iteration of the operating model, partner network management, and user feedback loops. The pilot is structured in three distinct phases of user scaling: an initial cohort of 500 users to validate core flows, a secondary expansion to 1,000 users to test scalability and partner capacity, and a final MVP phase scaling to 10,000 users to assess market fit and operational readiness for broader expansion. The entire MVP development and initial rollout are to be completed within a stringent three-month timeline, a constraint that has heavily influenced the prioritization of features detailed in the MoSCoW framework. All references to other regions, such as Nigeria, have been explicitly removed from the MVP scope to maintain focus.

The platform's **Channel Strategy** employs a sophisticated hybrid model to balance user accessibility with a controlled application environment. The primary patient interface is a mobile-first application, initially for the Android platform, which serves as the hub for all persistent interactions. This includes the in-app messaging thread for AI intake and asynchronous communication, access to health records, viewing prescriptions, and navigating the service ecosystem. This native environment is complemented by strategic integration with the WhatsApp platform for two critical, high-trust functions. First, all user authentication is handled exclusively through WhatsApp-based One-Time Passwords (OTPs), eliminating reliance on SMS and its associated cost and deliverability issues. Second, all real-time, synchronous consultations, whether with a GP or a specialist, will be conducted via WhatsApp audio or video calls during the MVP phase. This leverages a ubiquitous, low-friction communication tool that users already trust, while the in-app environment captures all associated metadata, clinical notes, and follow-up actions, ensuring a complete and auditable patient record. There will be no SMS or USSD fallback channels in the MVP.

The ecosystem is defined by a clear set of **User Roles and Responsibilities**. The **Patient** initiates care, engages with the AI and clinicians, and acts upon the curated options presented. The **General Practitioner (GP)** serves as the clinical front door, conducting initial consults, issuing prescriptions, and orchestrating referrals. The **Specialist**, engaged only via GP referral, provides expert consultation and orders advanced diagnostics. Partner roles, including the **Pharmacy Admin** and **Diagnostics Admin**, operate within purpose-built, PII-minimized portals to fulfill orders securely. An internal **Ops Admin** team manages the provider network, coordinates complex bookings, and oversees service level agreements. Finally, a **Support** role has time-boxed, audited access with masked data views to assist users with technical and operational issues.

2. Patient Journey & Core Service Flows

The Mediconnect platform is designed around a series of interconnected service flows that guide the patient from initial contact to resolution. Each flow is engineered to reinforce the HaaS model, with the GP orchestrating the journey and technology enabling a seamless, secure, and efficient experience.

The patient journey begins with **Onboarding and Authentication**. A new user's first interaction is a streamlined setup process that begins with language selection (English or Swahili) and proceeds through a series of mandatory consent gates for age verification (18+), telemedicine services, and data privacy. The core of the authentication mechanism is a WhatsApp-only OTP system. The user enters their phone number, and the backend system triggers an OTP delivery via a pre-approved WhatsApp message template. This approach circumvents traditional SMS, leveraging a more reliable and cost-effective channel. Upon successful verification, a secure session is established, and the user completes a minimal profile setup before being directed to the main application interface.

The cornerstone of the clinical experience is the **GP Consultation Flow**. Every request for a real-time consultation is initiated through a mandatory **AI Intake** process within the in-app chat interface. This adaptive questionnaire gathers structured information about the patient's symptoms, onset, and severity, generating a concise summary for the GP. This pre-consultation step significantly reduces discovery time, allowing the clinician to begin the interaction with valuable context. Once the intake is complete, the system assigns an available GP. The synchronous consultation itself is conducted via a WhatsApp video call, with a standard duration of 15 minutes. The in-app chat thread remains active for sharing notes, attachments, and follow-up information. This hybrid approach combines the richness of video with the persistence and structure of an in-app message thread.

When a condition requires specialized expertise, the GP initiates the **Specialist Referral Flow**. This process is entirely GP-gated and appointment-based, not a real-time queue or marketplace. Based on the initial consult, the GP determines the need for a referral and discusses it with the patient. If the patient agrees, the GP's consultation window is automatically extended by 10 minutes, allowing them to present a curated list of 3-4 vetted specialist options (either local for in-person visits or online). The patient makes a selection from this limited list, and the request is routed to the Mediconnect Ops team, which coordinates the final booking. This ensures that all referrals are clinically appropriate and that the patient is matched with a trusted provider within the network.

The **Prescription and Pharmacy Flow** is designed for safety, security, and convenience. Following a consultation, the GP can issue a digital e-prescription, which becomes immediately available to the patient in-app. The prescription artifact includes both a downloadable PDF and a secure QR code. The application displays a map of nearby verified pharmacies within the Mediconnect network. The patient has two primary fulfillment options: they can visit any verified pharmacy and present the QR code for scanning, or they can download the PDF for use at any pharmacy, including those outside the network. A critical security feature is that the act of downloading the PDF permanently disables the QR code, preventing duplicate fulfillment attempts. When a verified partner pharmacy scans the QR code, their portal displays only the necessary medication details, with all patient PII remaining masked to protect privacy.

Finally, the **Diagnostics Flow** is owned and managed by the specialist to ensure clinical appropriateness. Only a specialist, following a referral and consultation, can order diagnostic tests. The order is transmitted electronically to a verified partner lab. The lab's administrative portal is designed with strict data minimization principles, exposing only the essential information required for fulfillment: the patient's name, an order ID, the list of tests, and a masked phone number. Once the tests are complete, the lab uploads the results directly to the platform. The results are then made available to the ordering specialist and the patient simultaneously, ensuring timely access to critical health information.

3. Functional Requirements (MoSCoW Prioritization)

The features for the Mediconnect MVP have been rigorously prioritized using the MoSCoW method (Must Have, Should Have, Could Have, Won't Have) to ensure that the most critical functionality is delivered within the three-month timeline while maintaining a clear roadmap for future development.

The **Must Have** requirements represent the non-negotiable core of the MVP, forming the essential functionality for a viable service launch. This includes the complete WhatsApp-only authentication flow, which is fundamental to user access. The mandatory AI Intake gate and the persistent in-app messaging thread are critical for structuring the clinical workflow. The GP-led synchronous consultations via WhatsApp video, with their defined 15-minute time cap and 10-minute extension for referral discussions, constitute the primary care delivery mechanism. The GP-curated, appointment-based specialist referral flow is essential to the HaaS model. The end-to-end prescription and pharmacy flow, featuring the QR/PDF system, the item-only view for pharmacies, and the QR disablement rule, is a core safety and operational requirement. Similarly, the specialist-owned diagnostics ordering process with minimal PII exposure is a must-have. The platform must also support asynchronous offline Q&A with a 3-6 hour SLA, a robust notification system for both in-app and WhatsApp channels, and a comprehensive security model based on Row-Level Security (RLS) and detailed audit logging. Foundational operational capabilities such as data retention policies, a minimal Ops Console for managing rosters and escalations, and localization for English and Swahili are also included in this category.

The **Should Have** requirements are features that are highly important for enhancing the efficiency, reliability, and user experience of the MVP but are not absolute blockers for the initial launch. These can be implemented if time permits or prioritized immediately post-launch. This list includes automation for appointment scheduling and rescheduling to reduce the manual burden on the Ops team, and a smart rostering system for GPs to enable fair load balancing and skill-based routing. A lightweight Patient Health Profile for storing key information like allergies and chronic conditions is a significant value-add. Enhanced consent management for granular data sharing, and a more advanced Ops Console with calendar views and partner onboarding workflows, would greatly improve operational efficiency. Pharmacy enhancements, such as handling substitution policies and managing claim disputes, are also designated as Should Haves. For diagnostics, providing catalogs and cost estimates would improve transparency. User experience improvements like support for audio notes in the chat thread and more granular notification preferences fall into this category, as do critical backend enhancements like enforcing MFA for admins, implementing more advanced disaster recovery protocols (Point-in-Time Recovery), and using feature flags for controlled rollouts.

The **Could Have** requirements are desirable features that are considered non-essential for the MVP but offer significant value for future iterations, particularly in enhancing patient engagement. These are patient-facing features that enrich the user experience. Examples include serving contextual health education cards within the chat thread based on the diagnosis, providing medication reminders and adherence tracking, and allowing patients to request a self-reschedule of appointments. Other could-haves are pre-visit preparation checklists, procedure cost previews, and the ability to create family profiles for managing dependents’ care. Technical enhancements like a low-bandwidth data saver mode, photo uploads for symptoms, and voice note input would improve accessibility. Engagement features such as post-consult feedback surveys and a curated second-opinion request workflow are also part of this future-looking set.

Finally, the **Won’t Have** list explicitly defines what is out of scope for the MVP, which is crucial for managing stakeholder expectations and preventing scope creep. Critically, the MVP will not include native in-app video calling; all real-time calls will be via WhatsApp. It will not support any authentication methods other than WhatsApp OTP, such as SMS or email. The platform will not feature any patient-facing marketplaces for browsing doctors, pharmacies, or labs. Patients will not be able to self-book appointments with specialists directly. The system will not record any audio or video from consultations. Furthermore, there will be no home delivery logistics for medications, no integration with insurance providers for billing, and no in-app payment processing. The AI will function as a triage and summarization tool only; it will not provide autonomous diagnoses or prescriptions. These exclusions are fundamental to delivering a focused, secure, and operationally manageable product within the specified timeline.

4. Non-Functional Requirements (NFRs)

The success of the Mediconnect platform depends not only on its features but also on its underlying quality attributes. These non-functional requirements define the standards for security, performance, reliability, and data management that the system must meet to be considered production-ready for the pilot.

Security and Privacy are paramount. The architecture must be built on a principle of least privilege, enforced at the database level through robust Row-Level Security (RLS) policies. This ensures that users and roles can only access data they are explicitly authorized to see. PII minimization is a core design constraint for all partner-facing interfaces; pharmacies will have an item-only view of prescriptions, and diagnostic labs will see only the minimal data set required for fulfillment. Internal access will be strictly controlled, with the Support team using time-boxed sessions with masked PII by default, and the Ops team requiring explicit, audited, purpose-based reasons to unmask sensitive data. All data must be encrypted both in transit (using TLS 1.2 or higher) and at rest. A comprehensive audit log must capture all significant events, particularly those involving access to or modification of patient data.

The platform must meet defined **Scalability and Performance** targets to handle the phased user rollout. The system must be architected to support up to 10,000 monthly active users by the end of the pilot phase. It should comfortably handle a peak concurrency of at least 60 simultaneous chat sessions. Key API endpoints, especially those involved in the critical path of user interaction such as authentication, message sending, and prescription claims, must have a P75 latency of less than 500 milliseconds. The user interface must feel responsive, with critical screens like the chat thread loading the last 50 messages in under 1.5 seconds.

Reliability and Availability are critical for maintaining user trust. The core services of the platform must target an availability of at least 99.5% during the pilot. A disaster recovery plan must be in place, with a Recovery Point Objective (RPO) of one hour or less and a Recovery Time Objective (RTO) of four hours or less. This ensures that in the event of a major failure, data loss is minimal and service can be restored promptly. Given the critical dependency on the WhatsApp platform, detailed runbooks must be created to manage potential outages or API degradation, outlining clear steps for internal response and user communication.

A formal **Data Management** policy will govern the lifecycle of information within the platform. The retention policy for “hot” or immediately accessible data will be 90 days for chat history and associated media, and 24 months for prescription records. After these periods, data will be moved to a secure, lower-cost archival storage solution, such as Cloudflare R2, to minimize egress fees. Pointers to this archived data will be maintained in the production database, and a well-documented, audited process must exist for restoring archived data on demand for clinical or legal reasons.

Finally, **Localization** is a key requirement for the Nairobi pilot. The patient-facing user interface, including all screens, prompts, and notifications, must be available in both English and Swahili. All legal documents, such as the Terms of Service and Privacy Policy, will be provided in English for the MVP. The system must be architected to easily support the addition of more languages in the future.

5. High-Level Technical Architecture

The technical architecture of Mediconnect is designed to be modular, scalable, and secure, leveraging modern cloud services and a clear separation of concerns to facilitate rapid development and iteration.

The system is composed of several logical **System Components**. The primary user interface will be a **Patient Application**, developed as a mobile-first experience for Android. A suite of web-based **Partner Portals** will provide secure, role-based access for GPs, Specialists, Pharmacy Admins, and Diagnostics Admins. The core logic will reside in a set of **Backend Services**, likely developed in Node.js/TypeScript, which will handle business logic, data processing, and integrations. These services will be exposed via a secure API Gateway. The data persistence layer will be a **PostgreSQL Database**, chosen for its robustness and native support for the Row-Level Security policies that are central to the platform’s security model. Binary data, such as uploaded documents and archived records, will be stored in an **S3-compatible Object Storage** service.

The **Data Model Overview** reflects the HaaS operating model. Key entities include `user`, `consult`, `message`, `referral`, `appointment`, `prescription`, `pharmacy_claim`, and `lab_order`. The relationships between these entities are designed to enforce the GP-gated workflows. For example, a `referral` can only be created in the context of a `consult` by a GP. A `lab_order` must be linked to a `specialist`, and a `pharmacy_claim` is tied to a single `prescription`. The schema includes specific fields to manage the unique business rules, such as `qr_enabled` and `pdf_downloaded_at` on the `prescrip-

`tion` table to enforce the one-way fulfillment flow. The RLS policies will be directly tied to these relationships, ensuring data access is contextually and programmatically controlled.

The platform relies on a small number of critical **Key Integrations**. The most significant is the **WhatsApp Cloud API**, which is used for two distinct purposes: sending authentication templates for OTP verification and providing the deep links for initiating audio and video calls. A reliable **Mapping Provider** is required to power the pharmacy discovery feature, displaying geolocations of verified partners. Finally, a **Push Notification Service** will be integrated to deliver timely, in-app alerts to users about the status of their consultations, prescriptions, and other critical events. The architecture must be designed to be resilient to failures in these external dependencies, with appropriate retry logic, error handling, and operational runbooks.

Conclusion

The technical and functional requirements outlined in this document provide a comprehensive foundation for the development of the Mediconnect MVP. The HaaS model, centered on a GP-orchestrated patient journey, establishes a clear and defensible product strategy. The hybrid channel approach, which intelligently combines a primary in-app experience with the ubiquity of WhatsApp for authentication and real-time calls, is tailored to the target market’s behaviors and technical landscape. The rigorous MoSCoW prioritization ensures that the engineering team can focus on a well-defined, achievable scope that delivers core value within the aggressive three-month timeline. By adhering to these specifications, the product and engineering teams will be well-equipped to build a secure, reliable, and user-centric healthcare platform poised for a successful pilot launch in Nairobi.