

Software Requirements Specification for NurseConnect: A Location-Aware Home Nursing Platform

Prepared for Graduation Project

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1 Introduction

1.1 Purpose

This Software Requirements Specification (SRS) outlines the functional and non-functional requirements for NurseConnect, a location-aware home nursing platform. The document serves as a blueprint for the development team to implement a Minimum Viable Product (MVP) for a graduation project, enabling patients to connect with verified nurses for home healthcare services. It is intended for developers, project stakeholders, and academic evaluators to ensure alignment on system scope, features, and constraints.

1.2 Scope

NurseConnect is a web-based platform that connects patients with verified home nurses based on location, facilitating service requests, bookings, and secure payments. Key features include:

- Verified nurse profiles with admin approval.
- Location-based nurse-patient matching.
- Appointment scheduling and availability management.
- Secure payment processing with platform commission.
- Safety features like reviews, ratings, and reporting.
- Ad placement for monetization and nurse recruitment campaigns.

The MVP targets English-speaking users, with UTF-8 support for future internationalization. The system adheres to healthcare regulations (e.g., HIPAA for U.S. markets) and ensures accessibility per WCAG 2.1 standards. Benefits include improved access to home healthcare, trust through verification, and scalability for future growth.

1.3 Definitions, Acronyms, and Abbreviations

- **Geo-Matching:** Ranking nurses by proximity to patient location using GPS or manual input.
- **MVP:** Minimum Viable Product, the initial feature set for launch.
- **HIPAA:** Health Insurance Portability and Accountability Act, U.S. health data regulation.
- **2FA:** Two-Factor Authentication for enhanced security.
- **WCAG:** Web Content Accessibility Guidelines for inclusive design.

1.4 References

- HIPAA regulations: <https://www.hhs.gov/hipaa>

- WCAG 2.1: <https://www.w3.org/TR/WCAG21/>
- Stripe API (v3): <https://stripe.com/docs/api>
- Google Maps API (v3): <https://developers.google.com/maps>

1.5 Overview

This SRS is organized as follows:

- **Section 2:** Overall description, including constraints and assumptions.
- **Section 3:** Detailed system features with functional requirements.
- **Section 4:** External interface requirements.
- **Section 5:** Nonfunctional requirements.
- **Section 6:** Other requirements, including legal and database specifications.
- **Appendices:** Glossary, analysis models, and issues list.

2 Overall Description

2.1 Product Perspective

NurseConnect is a standalone web application with integrations to third-party services (e.g., Stripe for payments, Google Maps for location services). It operates as a three-tier system (frontend, backend, database) with role-based access for patients, nurses, and admins. The platform interfaces with external APIs for payments, location services, and email notifications, ensuring modularity and scalability.

2.2 Product Functions

- **Nurse Profiles:** Nurses create and manage profiles with verified credentials.
- **Patient Requests:** Patients request services and are matched with nearby nurses.
- **Booking:** Patients schedule appointments; nurses manage availability.
- **Payments:** Secure transactions with 12% platform commission.
- **Safety:** Reviews, ratings, and reporting for trust.
- **Monetization:** Ad placements for medical products and partner clinics.
- **Recruitment:** Nurse nomination and location-based recruitment campaigns.

2.3 User Classes and Characteristics

- **Patients:** Individuals seeking home nursing services; require intuitive UI and accessibility.

- **Nurses:** Licensed professionals managing profiles and bookings; need clear workflows.
- **Admins:** Platform moderators handling verification, reports, and ad management; require robust tools.

2.4 Operating Environment

- **Frontend:** Angular (v18) for responsive, component-based UI; alternatives: React (v18), Vue.js (v3).
- **Backend:** Laravel (v11) with PHP for RESTful API; alternatives: Node.js (Express), Django.
- **Database:** PostgreSQL for relational data; alternatives: MySQL.
- **Location Services:** Google Maps API (v3) or browser-based GPS; manual input fallback.
- **Network:** Stable internet (minimum 1 Mbps) for real-time interactions.
- **Constraints:** Must avoid conflicts with browser extensions; supports Chrome, Firefox, Safari, Edge (latest versions).

2.5 Design and Implementation Constraints

- **Regulatory Compliance:** Adhere to HIPAA (U.S.) or GDPR (EU) for data protection.
- **Technology:** Laravel for backend scalability; Angular for dynamic frontend; integrate Stripe for payments.
- **Verification:** Manual admin verification for nurse profiles in MVP.
- **Localization:** English-only for MVP; UTF-8 support for future multi-language expansion.
- **Browser Compatibility:** Support latest Chrome, Firefox, Safari, Edge.

2.6 User Documentation

- **Patient Guide:** Web-based help for registration, service requests, and bookings.
- **Nurse Guide:** Tutorials for profile setup, document upload, and scheduling.
- **Admin Manual:** Internal guide for verification, moderation, and ad management.
- **Format:** Accessible via platform's help section; WCAG 2.1 compliant.

2.7 Assumptions and Dependencies

- **Assumptions:**
 - Nurses have valid credentials and internet access.
 - Patients provide accurate location data.
 - Regulatory compliance is met for initial launch (U.S. or specified region).
- **Dependencies:**
 - Stripe API for secure payments.
 - Google Maps API for geo-matching.
 - SendGrid for email notifications.
 - Admin availability for manual verification.

3 System Features

3.1 Verified Nurse Profiles

3.1.1 Description and Priority

Nurses create profiles with certifications, skills, and work history, verified by admins. Priority: High (core trust feature).

3.1.2 Stimulus/Response Sequences

1. **Stimulus:** Nurse submits profile with ID, license, and certificate.
2. **Response:** Admin reviews documents; approves/rejects within 48 hours.
3. **Stimulus:** Approved profile is activated.
4. **Response:** Profile displays “Certified Nurse” badge.

3.1.3 Functional Requirements

- **REQ-1:** System shall allow nurses to upload national ID, nursing license, and certificate (PDF, max 5MB) (High).
- **REQ-2:** System shall enable admins to review and approve/reject submissions within 48 hours (High).
- **REQ-3:** Approved profiles shall display a “Certified Nurse” badge (High).
- **REQ-4:** System shall notify nurses of approval/rejection via email (Medium).

3.2 Patient Requests & Location-Based Matching

3.2.1 Description and Priority

Patients submit service requests; system matches them with nearby nurses based on location (default 10-mile radius). Priority: High.

3.2.2 Stimulus/Response Sequences

1. **Stimulus:** Patient submits service request with location (GPS or manual).
2. **Response:** System displays nurses within 10 miles, ranked by proximity.
3. **Stimulus:** Patient selects nurse.
4. **Response:** System notifies nurse of request.

3.2.3 Functional Requirements

- **REQ-5:** System shall use GPS or manual input for patient location (High).
- **REQ-6:** System shall display nurses within 10 miles, sorted by distance (High).
- **REQ-7:** System shall notify nurses only if within serviceable area (High).
- **REQ-8:** System shall allow patients to view nurse ratings, specializations, and reviews (High).

3.3 Booking & Scheduling

3.3.1 Description and Priority

Patients book appointments; nurses manage availability. Priority: High.

3.3.2 Stimulus/Response Sequences

1. **Stimulus:** Patient selects nurse and appointment time.
2. **Response:** System confirms availability and books appointment.
3. **Stimulus:** Nurse updates availability.
4. **Response:** System reflects changes in scheduling options.

3.3.3 Functional Requirements

- **REQ-9:** System shall allow patients to schedule appointments or request immediate help (High).
- **REQ-10:** System shall enable nurses to set availability and accept/reject requests (High).
- **REQ-11:** System shall send booking confirmations via email (Medium).

3.4 Secure Payments & Commission

3.4.1 Description and Priority

Platform processes payments, deducts 12% commission, and transfers funds to nurses. Priority: High.

3.4.2 Stimulus/Response Sequences

1. **Stimulus:** Patient completes service and pays via platform.
2. **Response:** System deducts 12% commission, transfers remainder to nurse.
3. **Stimulus:** Transaction completes.
4. **Response:** System issues invoice to patient, payment record to nurse.

3.4.3 Functional Requirements

- **REQ-12:** System shall integrate with Stripe API (v3) for secure transactions (High).
- **REQ-13:** System shall deduct 12% commission per transaction (High).
- **REQ-14:** System shall transfer funds to nurse within 24 hours post-service (High).
- **REQ-15:** System shall generate invoices for patients and payment records for nurses (Medium).

3.5 Safety & Trust Features

3.5.1 Description and Priority

Includes reviews, ratings, and reporting for trust. Priority: High.

3.5.2 Stimulus/Response Sequences

1. **Stimulus:** Patient submits review/rating post-service.
2. **Response:** System updates nurse profile with rating.
3. **Stimulus:** User reports issue.
4. **Response:** Admin reviews report, takes action (e.g., suspend user).

3.5.3 Functional Requirements

- **REQ-16:** System shall allow patients to submit star ratings (1-5) and reviews post-service (High).
- **REQ-17:** System shall enable users to report issues to admins (High).
- **REQ-18:** System shall require users to agree to terms of service during registration (High).

3.6 Ad Placement and Monetization

3.6.1 Description and Priority

Platform displays ads for medical products and partners. Priority: Medium.

3.6.2 Stimulus/Response Sequences

1. **Stimulus:** Admin uploads ad content (image, link, text).
2. **Response:** System displays ads in designated banner zones.

3.6.3 Functional Requirements

- **REQ-19:** System shall display banner ads for verified medical products (Medium).
- **REQ-20:** System shall support ad placement for partner clinics/labs (Medium).

3.7 Nurse Nomination and Recruitment

3.7.1 Description and Priority

Nurses can be nominated; platform runs location-based recruitment. Priority: Medium.

3.7.2 Stimulus/Response Sequences

1. **Stimulus:** User nominates nurse via email.
2. **Response:** System sends nomination invite to nurse.
3. **Stimulus:** Admin launches recruitment campaign.
4. **Response:** System targets nurses in specified areas.

3.7.3 Functional Requirements

- **REQ-21:** System shall allow users to nominate nurses via email invites (Medium).
- **REQ-22:** System shall support location-based recruitment campaigns (Medium).

4 External Interface Requirements

4.1 User Interfaces

- **Patient UI:** Angular-based dashboard for service requests, nurse selection, and bookings; responsive design.
- **Nurse UI:** Profile management, availability settings, and request notifications.
- **Admin UI:** Verification queue, moderation tools, and ad management.
- **Standards:** WCAG 2.1 compliant; consistent buttons (e.g., “Book Now”).

4.2 Hardware Interfaces

- **Devices:** Supports PCs, laptops, tablets, and smartphones with GPS.
- **Data:** Location data via browser GPS; no direct hardware control.

4.3 Software Interfaces

- **Payment Gateway:** ~~Stripe API (v3)~~ for transactions; data includes amount, user ID, timestamp.
- **Location Service:** Google Maps API (v3) for geo-matching; data includes latitude/longitude.
- **Email Service:** SendGrid for notifications; SMTP-based.

4.4 Communications Interfaces

- **Protocols:** HTTPS for secure data transfer; SMTP for emails.
- **Security:** TLS 1.3 for encryption; no FTP/HTTP used.
- **Formats:** JSON for API communications; HTML for emails.

5 Other Nonfunctional Requirements

5.1 Performance Requirements

- **Response Time:** Page loads < 2 seconds; geo-matching < 1 second (95% of requests).
- **Scalability:** Support 1,000 concurrent users in MVP.
- **Transaction Time:** Payment processing < 5 seconds.

5.2 Safety Requirements

- **Data Integrity:** Ensure accurate storage of medical credentials.
- **Error Handling:** Display user-friendly error messages for invalid inputs.

5.3 Security Requirements

- **Authentication:** Email/password login with 2FA option.
- **Data Protection:** Encrypt sensitive data (e.g., IDs, licenses) at rest using AES-256.
- **Compliance:** Adhere to HIPAA (U.S.) or GDPR (EU) for patient data.
- **Access Control:** Role-based access for patients, nurses, admins.

5.4 Software Quality Attributes

- **Usability:** Intuitive UI with < 3 clicks to book a nurse.
- **Reliability:** 99.5% uptime for platform.
- **Maintainability:** Modular Laravel/Angular code for easy updates.
- **Portability:** Browser-agnostic; supports multiple devices.

5.5 Testing Requirements

- **Unit Testing:** Test individual Laravel controllers and Angular components.
- **Integration Testing:** Verify API integrations (Stripe, Google Maps, Send-Grid).
- **Usability Testing:** Ensure WCAG 2.1 compliance and intuitive navigation.
- **Security Testing:** Validate encryption, 2FA, and role-based access.

6 Other Requirements

6.1 Legal Requirements

Users must accept terms of service compliant with local healthcare laws (e.g., HIPAA for U.S., GDPR for EU). Non-U.S. markets require equivalent data protection compliance (e.g., PIPEDA for Canada).

6.2 Database Requirements

- **Type:** PostgreSQL (v16) for relational data; alternatives: MySQL.
- **Data:** Store user profiles, bookings, transactions, and ad content.
- **Schema:** Normalized to reduce redundancy; includes audit logs for compliance.

6.3 Internationalization

- **MVP:** English-only with UTF-8 encoding.
- **Future:** Support for additional languages (e.g., Spanish, Arabic) via i18n libraries.

6.4 Deployment Requirements

- **Server:** Cloud-based (e.g., AWS EC2) with Laravel Forge for deployment.
- **CI/CD:** GitHub Actions for continuous integration and deployment.
- **Monitoring:** Uptime monitoring and error tracking (e.g., Sentry).

7 Appendix A: Glossary

- **Geo-Matching:** Ranking nurses by proximity to patient location.
- **MVP:** Minimum Viable Product, initial feature set for launch.
- **HIPAA:** Health Insurance Portability and Accountability Act.
- **GDPR:** General Data Protection Regulation (EU).

8 Appendix B: Analysis Models

- **Data Flow Diagram:** To model patient requests, nurse matching, and payment flows (TBD).
- **Entity-Relationship Diagram:** To model users, bookings, and transactions (TBD).

9 Appendix C: Issues List

- **TBD-1:** Default geo-matching radius set to 10 miles.
- **TBD-2:** Non-U.S. markets require GDPR (EU) or PIPEDA (Canada) compliance.
- **TBD-3:** Commission finalized at 12%.

10 Appendix D: Version History

- **Version 1.0:** Initial draft for graduation project (June 10, 2025).