# Software Requirements Specification

For System Performance & Scalability Version 1.0

April 01, 2025

## 1. Purpose

The primary goal of this system is to provide a comprehensive platform for healthcare management, streamlining administrative tasks and enhancing patient care. This system aims to improve operational efficiency, reduce costs, and provide a secure and accessible environment for patients and providers. The business value lies in improved patient outcomes, increased revenue through efficient billing, and enhanced compliance with industry regulations.

## 2. Scope

* **Included Features:** User registration and management, appointment scheduling, e-prescribing integration, secure payment processing, notification system, reporting and analytics, provider management, patient data management, and a secure patient portal.
* **System Boundaries:** The system encompasses all functionalities related to patient and provider management, scheduling, billing, and reporting. It includes integrations with external e-prescribing and payment gateway systems.
* **Excluded Features:** Complex medical imaging analysis, advanced AI-driven diagnostics, and direct integration with laboratory equipment are explicitly excluded from the initial scope.

## 3. Stakeholders

* **Patients:** Access and manage their health information, schedule appointments, and communicate with providers. (Responsibility: Provide accurate information and adhere to system policies.)
* **Providers (Doctors, Nurses):** Manage patient records, schedule appointments, prescribe medications, and generate reports. (Responsibility: Maintain accurate patient records and adhere to ethical guidelines.)
* **Administrators:** Manage user accounts, configure system settings, generate reports, and ensure system security. (Responsibility: Maintain system integrity and enforce security policies.)
* **Billing Department:** Process payments, generate invoices, and manage financial records. (Responsibility: Ensure accurate billing and compliance with financial regulations.)
* **IT Department:** Maintain system infrastructure, ensure data security, and provide technical support. (Responsibility: Ensure system availability and data integrity.)

## 4. Features

* **User Management:** Secure registration, profile management, and role-based access control.
* **Appointment Scheduling:** Calendar-based scheduling with booking, rescheduling, cancellation, and automated reminders.
* **E-Prescribing:** Integration with e-prescribing systems for electronic prescription management.
* **Payment Processing:** Secure payment gateway integration for online payment processing.
* **Notifications:** Customizable notification system with support for email, SMS, and in-app notifications.
* **Reporting & Analytics:** Customizable dashboards and data visualization tools for generating reports and analytics.
* **Provider Management:** Provider registration, profile management, and license verification.
* **Patient Data Management:** Secure storage and retrieval of patient demographics, medical history, and insurance information.
* **Patient Portal:** Secure online portal for patients to view and update their information.

## 5. Functional Requirements Section

* [FR-001]: The system shall provide capabilities for data processing, scheduling, and reporting. [High] (Source: Explicit)
* [FR-002]: The system shall provide integration capabilities with other systems. [Medium] (Source: Explicit)
* [FR-003]: The system shall implement user registration workflows, profile management features, and granular access controls based on roles (patient, family member, etc.). [High] (Source: Gap - Users Management)
* [FR-004]: The system shall implement a calendar-based appointment system with features for booking, rescheduling, cancellation, and automated reminders. [High] (Source: Gap - Appointment System)
* [FR-005]: The system shall integrate with e-prescribing systems and ensure compliance with relevant regulations. [High] (Source: Gap - Prescription Management)
* [FR-006]: The system shall integrate with secure payment gateways and ensure compliance with PCI DSS. [High] (Source: Gap - Payment Processing)
* [FR-007]: The system shall implement a notification system with support for various channels (email, SMS, in-app) and customizable notification settings. [Medium] (Source: Gap - Notifications)
* [FR-008]: The system shall implement reporting and analytics features with customizable dashboards and data visualization tools. [Medium] (Source: Gap - Reporting & Analytics)
* [FR-009]: The system shall implement provider registration workflows, profile management features, and integration with relevant databases for license verification. [High] (Source: Gap - Doctor/Provider Management)
* [FR-010]: The system shall capture and manage basic patient demographics, medical history, and insurance information. [High] (Source: Clarification - Patient Management)
* [FR-011]: The system shall provide a secure patient portal for viewing and updating limited information. [High] (Source: Clarification - Patient Management)
* [FR-012]: The system shall manage provider schedules and availability with an integrated scheduling system and real-time availability updates. [High] (Source: Clarification - Doctor/Provider Management)
* [FR-013]: The system shall track and manage provider basic contact information and specialty. [Medium] (Source: Clarification - Doctor/Provider Management)

## 6. Non-Functional Requirements Section

* [NFR-001]: The system shall demonstrate robust performance, with response times for common operations (e.g., login, data retrieval) not exceeding 3 seconds under normal load. [High]
* [NFR-002]: The system shall be scalable to accommodate a 50% increase in users and data volume within the next 2 years without significant performance degradation. [High]
* [NFR-003]: The system shall maintain optimal performance under high user concurrency (up to 100 concurrent users) and data volume conditions. [High]
* [NFR-004]: The design shall accommodate future scalability, feature extensions, and evolving business needs through a modular and extensible architecture. [High]
* [NFR-005]: The system shall be user-friendly and accessible, adhering to WCAG 2.1 Level AA accessibility guidelines. [Medium]

## 7. Security Requirements Section

* [SR-001]: The system shall ensure data security by implementing industry-standard encryption for data at rest and in transit. [High]
* [SR-002]: The system shall comply with industry standards such as HIPAA for patient data privacy and security. [High]
* [SR-003]: The system shall comply with industry-specific regulations related to e-prescribing and payment processing. [High]
* [SR-004]: The system shall implement granular access controls based on user roles to restrict access to sensitive data. [High]
* [SR-005]: The system shall undergo regular security audits and penetration testing to identify and address vulnerabilities. [High]

## 8. Constraints Section

* **Technical Limitations:** The system must be compatible with existing infrastructure and integrate with specified third-party APIs.
* **Business Rules:** All patient data must be handled in accordance with HIPAA regulations. Appointment scheduling must adhere to provider availability.
* **Regulatory Requirements:** The system must comply with all applicable federal, state, and local regulations related to healthcare data privacy and security.
* **Budgetary Constraints:** The total development cost must not exceed the allocated budget.

## 9. Priorities Section (MoSCoW)

* **Must Have:** User registration, appointment scheduling, patient data management, data security, HIPAA compliance, e-prescribing integration, secure payment processing.
* **Should Have:** Notification system, reporting and analytics, provider management, patient portal.
* **Could Have:** Advanced reporting features, integration with wearable devices.
* **Won’t Have:** Complex medical imaging analysis, AI-driven diagnostics in the initial release.

## 10. Additional Section

The system should be designed with future integration capabilities in mind, allowing for seamless integration with emerging healthcare technologies. Consideration should be given to incorporating telehealth functionalities in future releases. The system should also be designed to support multiple languages to accommodate a diverse patient population.