**HealthSync Detailed Requirements Document**

Prepared for MedSolutions and HealthSync by Insight Health Consulting

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# Introduction

# Purpose

This document outlines the detailed requirements for HealthSync, an integrated healthcare management software designed for medium-sized clinics.

# High-Level Scope

HealthSync aims to streamline patient records, appointment scheduling, billing, telemedicine services, and patient engagement for clinics with 5 to 50 practitioners.

The project deliverables include fully functional software, training materials, and post-launch support.

# Acronyms and Abbreviations

* **EHR**: Electronic Health Records
* **HIPAA**: Health Insurance Portability and Accountability Act
* **API**: Application Programming Interface
* **HL7 FHIR**: Health Level Seven Fast Healthcare Interoperability Resources
* **RBAC**: Role-Based Access Control
* **RPO**: Recovery Point Objective
* **RTO**: Recovery Time Objective
* **WCAG**: Web Content Accessibility Guidelines

# Goals and Objectives

Deliver a user-friendly, scalable, and HIPAA-compliant platform by March 31, 2024.

Reduce administrative burdens and enhance patient care for clinics with 5 to 50 practitioners.

Ensure seamless integration with existing systems and third-party tools.

# Stakeholders

## Internal (Insight Partners)

Anne Scoville, SME & Lead Business Analyst

Dennis Lahey, Business Analyst

Mike Peffer, Technical Consultant & Lead Engineer

Tonya Dewit, Developer

Sam Straka, Architect

Dani Lai, Quality Assurance Advisor

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## Client (HealthSync) IT

Sandra Martin, SME

Lori Schach, Lead Business Analyst

Don Wilt, Technical Consultant

Anne Carey, Business Process Analyst

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## Client (HealthSync) Pilot Clinics

Sandy Kenniston, GoWell Health

Kelly Crompton, Minute Minder Urgent Care

Jenny Dowker, Friendship Center Care Clinic

Cynthia Hotsky, General Boat Onsite Clinics

Kristin Harkness, Swing-In Health

# Overall Description

## Product Perspective

HealthSync is a brand new standalone system designed to be a “one-stop shop” for integration from all other systems and from which all work around a patient can be performed.

## User Classes

Doctors

Nurse Practitioners

Nurses

Medical Support Staff (radiologists, phlebotomists, etc.)

Care, Disease and Utilization Management staff

Clinical administrative staff

Patients

## In Scope

### Creation of the backend functionality

### Creation of UI

### APIs for interoperability

### Training materials

### Organizational change management plan

### System security requirements

### Performance and uptime requirements

### Data migration from existing MedSolutions systems into HealthSync

## Out of Scope

### Changes to existing MedSolutions systems

### Accommodation of MedSolutions current processes

### Business process redesign (handled by HealthSync team)

## Assumptions

* + 1. Users have basic computer literacy
    2. Clinics have reliable internet connectivity
    3. Integration partners will provide necessary API access and documentation
    4. Stakeholders will provide timely feedback
    5. HIPAA laws will remain in effect throughout the life of the project and for the next 5 years

### AI displacement of HL7 and FHIR will not occur for the next 5, so no adjustments will be required to interoperability to accommodate new standards or mandates.

### Systems with which HealthSync will interface will provide APIs for HealthSync to leverage.

### No coding on the part of interface partners will be required - HealthSync will use APIs as they are provided to us.

### Data normalization will occur in the ETL layer being built under a separate project.

## Constraints

### Funding for this project relies on the Interoperability Grant being sought by MedSolutions. Although the grant funding is approved, there is a congressional act required to finalize it. Until the grant is final, only $2m of the project budget can be spent.

### The ETL team anticipates having the ETL layer and data normalization components complete at least six months prior to HealthSync MVP; however, this product is dependent on that data normalization as soon as we begin the interoperability efforts in phase 2 (post MVP).

* + 1. Development must be completed within 9 months (July 1, 2023 – March 31, 2024)
    2. The system must operate within a budget of $5 million for initial development
    3. Third-party integrations are subject to the limitations of external systems
    4. Compliance with evolving healthcare regulations

## Risks

### There is a risk that if grant funding is not processed prior to exhausting the $2m initial funds, the project may need to be put on hold.

### No research has been done on external product APIs for interoperability; however, if those APIs do not provide what is needed, we may wind up working with those companies as partners to enhance their APIs for HealthSync.

* + 1. Regulatory Changes: Changes in healthcare laws could affect compliance.
    2. Technical Challenges: Integration with existing systems may pose difficulties.
    3. Scope Creep: Additional features requested mid-project could delay timelines.
    4. Resource Constraints: Availability of key personnel may impact progress.

## Risk Mitigation Strategies

* + 1. Regular Compliance Reviews: Stay updated with legal requirements.
    2. Technical Proof of Concepts: Early testing of integrations.
    3. Change Management Process: Formal procedure for handling scope changes.
    4. Resource Planning: Backup resources and cross-training team members.

## User Documentation

### Documentation will be provided in the form of a wiki and context sensitivity from within the product. No physical manuals will be provided.

# System Functional Requirements

## Electronic Health Records (EHR) Module:

### **Patient Profiles:** create, manage, and store comprehensive patient profiles, including demographics, contact information, insurance details, and emergency contacts

* Provide the ability to create a patient profile.
  + Patient profile information is taken from the EHR system connected to HealthSync.
  + Patients have the ability to update information on their own profiles:
    - Demographic information
    - Profile picture
    - About me information
    - Insurance information
  + Only administrative staff at the clinics have the ability to update profiles:
    - Insurance information
    - Address and telephone numbers in the demographics information
    - Abuse questionnaire questions (not visible to patient)

### **Medical History:** Record and update detailed medical histories, including past illnesses, surgeries, hospitalizations, and family medical history

* All clinical personnel have the ability to record and update medical histories
* Clients do not have the ability to record and update medical histories

### **Medication Management:** Manage prescriptions and medication records: Manage prescriptions and medication records, including current medications, dosages, start and end dates, and prescription refill requests

* All clinical personnel have the ability to manage prescriptions and medication records
* Clients do not have the ability to manage prescriptions and medication records
* Clients have the ability to request prescription refills and ask questions about medications
* Providers and nurse practitioners have the ability to approve and send refills to pharmacies

### **Encounter Documentation:** Document patient encounters and progress notes. Document patient encounters and progress notes, including chief complaints, examination findings, diagnoses, treatment plans, and follow-up instructions.

* All doctors, nurses and nurse practitioners have the ability to document patient encounters and progress notes
* Patients have the ability to read progress notes and clinician notes

### **Care Plans:** Generate and manage care plans. Generate and manage care plans, including goals, interventions, and progress tracking.

* All doctors, nurses, nurse practitioners and care/case/disease management staff have the ability to generate and manage care plans
* Patients have the ability to view care plans

### **Integration:** Integrate with laboratory and imaging systems. Integrate with laboratory and imaging systems to receive and display lab results and medical images.

* Integrate with the following imaging systems:
  + Medis
  + Siemens
  + United Imaging
  + Springer
* Integrate with the following laboratory systems
  + STARLIMS
  + MedicsPremier
  + CGM LABDAQ
  + Labgen
  + Apex
  + Avalon

### **Specialty-Specific Templates**: Specialty-specific templates and secure patient profiles. Provide customizable templates tailored to different medical specialties

* Specialties for which templates need to be developed need to be defined

## Appointment Scheduling:

### **Appointment Management:** Create, modify, and cancel appointments. Create, modify, and cancel appointments, including specifying appointment type, provider, date, and time.

### **Multi-Provider Scheduling:** Implement multi-provider scheduling.Implement scheduling capabilities for multiple providers and departments within a clinic

### **Automated Reminders:** Send automated appointment reminders via email and SMS to reduce no-shows

### **Patient Self-Scheduling:** Allow patient self-scheduling through a portal

### **Real-Time Availability:** Real-time availability synchronization across providers and departments

## Billing and Claims Processing:

### **Claims Generation:** Generate and submit insurance claims electronically, adhering to industry standards and formats

### **Payment Processing:** Process payments and manage patient balances including support for various payment methods (credit card, online payments)

### **Financial Reporting:** Generate financial reports and analytics, including revenue tracking, expense analysis, and accounts receivable management

### **Payment Gateway Integration**: Integrate with common payment gateways to securely process online payments

### **Insurance provider integration:** Integration with insurance providers for electronic claims:

* + - 1. Blue Cross Blue Shield Association Partners
      2. NASCO
      3. Aetna
      4. Cigna
      5. United Healthcare
      6. Tricare
      7. Delta Dental
      8. Humana

## Telemedicine Services:

### **Virtual Consultations**: Conduct secure video and audio consultations between patients and providers

### **Image Sharing**: Share and annotate medical images and documents during consultations

### **EHR Integration:** Integrate with the EHR module to allow documentation during telemedicine visits

### **Waiting Room:** Provide a virtual waiting room feature for patients awaiting consultations

### **Remote Monitoring**: Integrate with wearable devices and home health equipment for remote patient monitoring

## Reporting and Analytics:

### **Customizable Reports:** Generate customizable clinical and operational reports to track key performance indicators (KPIs)

### Generate customizable clinical and operational reports

### **Real-Time Dashboards:** Provide real-time dashboards for monitoring clinic performance, patient outcomes, and financial metrics

### **Predictive Analytics:** Implement predictive analytics to identify trends, forecast patient outcomes, and optimize clinic operations

## Patient Portal

### **Record Access:** Allow patients to securely view their medical records, including lab results, medication lists, and immunization history

### **Secure Messaging**: Enable secure messaging between patients and providers for communication and follow-up

### **Prescription Refills**: Provide a feature for patients to request prescription refills online

### **Online Bill Pay**: Allow patients to view and pay their bills online

* + 1. **Educational Resources:** Customized health information and wellness tips
    2. **Feedback Mechanisms**: Surveys and questionnaires to improve service quality

## Integration:

* + 1. **HL7 FHIR Compliance**: Adhere to HL7 FHIR standards for seamless data exchange with other healthcare systems
    2. 4.7.2 **RESTful APIs**: Provide RESTful APIs for third-party integrations
    3. 4.7.3 **Existing Systems**: Facilitate seamless integration with existing systems and third-party tools

# Non-Functional Requirements:

## Performance:

### **Concurrent Users**: Support up to 500 concurrent users without performance degradation

* + 1. 5.1.2 **Page Load Times**: Ensure page load times of less than 2 seconds for 95% of requests
    2. 5.1.3 **Transaction Processing**: Process database transactions within 100 milliseconds
    3. Process database transactions within 100 milliseconds

## Security:

* + 1. **HIPAA Compliance**: Comply with HIPAA regulations for data privacy and security, ensuring the confidentiality, integrity, and availability of protected health information (PHI)
    2. 5.2.2 **Role-Based Access Control (RBAC)**: Implement RBAC to restrict access to sensitive data based on user roles and responsibilities
    3. 5.2.3 **Data Encryption**: Use encryption for data at rest and in transit (minimum AES-256) to protect against unauthorized access
    4. 5.2.4 **Security Audits**: Conduct regular security audits and penetration testing to identify and address vulnerabilities
    5. 5.2.5 **Authentication**: Multi-factor authentication for secure access
    6. 5.2.6 **Network Security**: Firewalls, intrusion detection systems, and regular security auditS

## Reliability:

* + 1. **System Uptime**: Achieve 99.9% system uptime to ensure continuous availability of the platform
    2. **Automated Backups**: Implement automated daily backups with point-in-time recovery to minimize data loss
    3. **Disaster Recovery**: Provide a disaster recovery plan with RPO less than 1 hour and RTO less than 4 hours to ensure business continuity in the event of a disaster

## Scalability:

* + 1. **Horizontal Scaling**: Support horizontal scaling to accommodate a growing user base and increasing transaction volumes
    2. **Data Growth**: Handle data growth of up to 1TB per year efficientlY

## Usability:

* + 1. **Intuitive Interface**: Design an intuitive user interface requiring minimal training for clinic staff and patients
    2. **Accessibility**: Ensure accessibility compliance with WCAG 2.1 Level AA standards to support users with disabilities
    3. **Responsive Design**: Support responsive design for access on various devices, including desktops, tablets, and smartphones

## Interoperability:

### **HL7 FHIR Standards:** Implement HL7 FHIR standards for healthcare data exchange with other systems

### **RESTful APIs:** Provide RESTful APIs for third-party integrations, enabling seamless data exchange with external application

### **EHR Integration**: Support integration with common EHR systems (Epic, Cerner, Allscripts) to facilitate data sharing and interoperability

## Compliance and Regulatory:

* + 1. **HIPAA Compliance**: Ensure all aspects of the system adhere to HIPAA Privacy and Security Rules
    2. **HITECH Act**: Comply with HITECH Act requirements for the meaningful use of EHR19
    3. **21st Century Cures Act**: Adhere to information blocking rules and promote interoperability, per the 21st Century Cures Act
    4. **State-Specific Regulations**: Comply with relevant state laws regarding telemedicine and electronic prescribing

# Data Migration

## **Completeness:** Migrate 100% of critical data from all other MedSolutions platforms into Healthsync

## **Accuracy:** Ensure zero data loss

# System Architecture

## **High-Level Architecture:** HealthSync will follow a microservices architecture

* + 1. **Frontend:** React.js
    2. **Backend:** Node.js with Express.js
    3. **Database:** PostgreSQL for relational data, MongoDB for unstructured data
    4. **Caching:** Redis
    5. **Message Queue:** RabbitMQ
    6. **Search Engine:** Elasticsearch
    7. **Containerization:** Docker
    8. **Orchestration:** Kubernetes

## **API Design:** RESTful API endpoints will be provided for all major functionalities, following OpenAPI 3.0 specifications

## **Integration Points:**

* + 1. **Electronic Health Records systems** (Epic, Cerner, Allscripts)
    2. **Laboratory Information Systems**
    3. **Medical Imaging systems (PACS/RIS)**
    4. **Insurance claim clearinghouses**
    5. **Payment gateways**

# Development and Deployment

## **Development Methodology:** Agile Scrum with two-week sprints

## **Version Control:** Git with GitHub for source code management

## **CI/CD:** Jenkins for automated building, testing, and deployment

## **Testing Strategy:**

* + 1. **Unit Testing:** Jest
    2. **Integration Testing:** Postman/Newman
    3. **End-to-End Testing:** Selenium
    4. **Performance Testing:** Apache JMeter
    5. **User Acceptance Testing**

## **Deployment Environment:** Amazon Web Services (AWS) cloud infrastructure