Software Requirements Specification

Project: Health Keeper

Document Sheet

Date	Revision	Autor	Verified
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Content

1 INTRODUCTION

HealthKeeper is a comprehensive caregiving assistant application designed to streamline the daily workflows of professional and family caregivers. By centralizing patient data, scheduling, clinical note–taking, and an array of embedded clinical calculators, HealthKeeper empowers caregivers to make faster, more informed decisions and to focus their time on what matters most—the well-being of their patients.

1.1 Purpose

The purpose of this requirements specification is to define and describe the functional needs for HealthKeeper's next release (v2.0.0). It covers foundational features—such as user authentication, patient profile management, vitals charting, medication scheduling, and event logging—alongside 12 new clinical calculation modules (e.g., BMI, eGFR, BMR, Braden Scale) that will automate key assessments and alerts for caregivers.

1.2 Scope

This document applies to all client-side and server-side components of HealthKeeper v2.0.0. It addresses user roles (caregiver, administrator), patient data management, real-time data capture (vital signs, fluid balance), scheduled reminders, and integrated clinical calculators. Non-functional considerations—such as performance, security, and usability—are covered elsewhere. This specification does not include future modules for telehealth video, third-party EHR interoperability, or billing.

1.3 Involved Staff

Name:	Paillacho Carlos
Rol:	Git Administrator
Professional Category:	Student
Responsibility:	File Administrator

Name:	Palacios Daniel
Rol:	Developer
Professional Category:	Student

Responsibility:	Communication and customer service.

Name:	Quiroz María
Rol:	Developer
Professional Category:	Student
Responsibility:	Senior programmer. Code development.

1.4 Definitions, Acronyms and Abbreviations

Name	Description
ERS	Software Requirements Specification

1.5 References

Document	Reference
Standard IEEE 830	IEEE

1.6 Summary

This specification outlines the complete feature set and functional requirements for HealthKeeper v2.0.0, an application tailored to streamline caregiver workflows. It encompasses core modules—user authentication, patient profiles, vital-sign logging, medication scheduling, and event documentation—augmented by a suite of 12 clinical calculators (e.g., BMI, eGFR, BMR, Braden Scale) that provide on-demand assessments and threshold-based alerts. Together, these capabilities will enhance data accuracy, improve decision support, and enable caregivers to deliver timely, personalized care.

2 OVERVIEW

HealthKeeper is a modular, client-server application designed to support the day-to-day responsibilities of professional and informal caregivers. The system unifies patient data management, time-series vital-sign logging, medication scheduling with reminders, event and note recording, and a suite of embedded clinical calculators—all accessible through an intuitive, role-based interface. Data is stored centrally on a secure backend, while caregivers interact via desktop or mobile clients, enabling both on-site and remote monitoring.

By combining core care-management workflows with automated assessment tools (e.g., BMI, eGFR, Braden Scale), HealthKeeper reduces manual calculation errors, accelerates decision support, and elevates overall care quality. The underlying architecture is service-oriented, allowing individual modules to be updated independently and new calculators to be plugged in with minimal impact. Detailed logging and alerting mechanisms ensure that critical thresholds trigger notifications, helping caregivers stay proactive.

2.1 Product Perspective

HealthKeeper is a standalone product but is designed for eventual interoperability with electronic health-record (EHR) systems and telehealth platforms. In its current form, the application comprises:

    a) Client Applications

Web Client: HTML5/JavaScript interface for desktop browsers, optimized for data entry and analytics dashboards.

Mobile Client: Native or hybrid UI for tablets and smartphones, focused on on-the-go data capture and push-notification alerts.

    b) Backend Services

Authentication Service: OAuth2-compliant module for secure login and token management.

Data API: RESTful endpoints for CRUD operations on patient profiles, vital signs, medications, events, and calculation results.

Calculation Engine: A microservice hosting all clinical calculators (BMI, eGFR, BMR, etc.), exposed via API calls to the client or other backend components.

Notification Service: Scheduler and dispatcher for reminders and threshold-based alerts via email, SMS, or push notifications.

The modular design permits HealthKeeper to operate in an isolated environment (e.g., a single clinic) or to integrate later with third-party health platforms via standard FHIR-based

interfaces. This flexibility ensures that as organizational needs grow, HealthKeeper can evolve without a complete system rewrit

2.2 Product Functionality
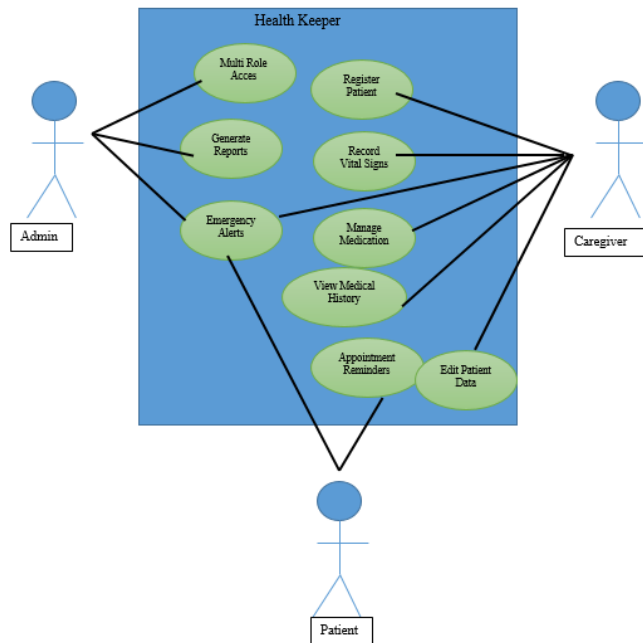
2.3 User Characteristics

User type:	Caregiver
Category:	Caregiver
Activities:	Fulfill the responsibilities of a patient caregiver.

2.4 Constraints

- Console-only platform.
- Programming language: Java.
- Predefined accounts.
- Does not process data in real time.
- Basic hardware resources.
- Basic authentication.

2.5 Assumptions and Dependencies

- It is assumed that the computers where the program will be executed have the hardware and software necessary for its proper operation.
- It is assumed that the users (caregivers) will follow the agreed-upon, predefined procedure.
- The program should be able to run on any computer with Java.

3 SPECIFIC REQUIREMENTS

3.1 Functional Requirements

Requirement ID:	RF01
Requirement Name:	User authentication and role-based access control
Characteristics:	Secure, standards-compliant authentication with fine-grained role controls.
Requirement Description:	Secure login and restrict features by user role
Requirement Priority:	High

Requirement ID:	RF02
Requirement Name:	Patient profile management
Characteristics:	Flexible profile CRUD operations with validation and audit trail.
Requirement Description:	Create, view, update, delete patient demographics
Requirement Priority:	High

Requirement ID:	RF03
Requirement Name:	Vital signs recording
Characteristics:	Real-time logging and graphical trends; supports interpolation for missing data.
Requirement Description:	Log and visualize time-series of vital signs
Requirement Priority:	High

Requirement ID:	RF04
Requirement Name:	Medication schedule and reminders

Characteristics:	Configurable schedule engine with push/sms reminders and retry logic.
Requirement Description:	Schedule doses, send reminders
Requirement Priority:	High

Requirement ID:	RF05
Requirement Name:	Event and note logging
Characteristics:	Timestamped, searchable event log with rich-text support.
Requirement Description:	Record clinical notes and events
Requirement Priority:	Medium

Requirement ID:	RF06
Requirement Name:	Body Mass Index (BMI) calculation
Characteristics:	Instant BMI computation with built-in categorization and threshold alerts.
Requirement Description:	Assess nutritional status
Requirement Priority:	Medium

Requirement ID:	RF07
Requirement Name:	Weight-based medication dosing
Characteristics:	Weight-based dosing calculator that auto-rounds to safe increments.
Requirement Description:	Assess nutritional status
Requirement Priority:	Medium

Requirement ID:	RF08
Requirement Name:	Estimated Glomerular Filtration Rate (eGFR)
Characteristics:	eGFR formula implementation (CKD-EPI/MDRD) with staging flags.
Requirement Description:	Evaluate renal function
Requirement Priority:	Medium

Requirement ID:	RF09
Requirement Name:	Daily fluid balance
Characteristics:	Automated intake/output aggregation and negative-balance alerts.
Requirement Description:	Track fluid input vs. Output

Requirement Priority:	Medium

Requirement ID:	RF10
Requirement Name:	Estimated daily caloric needs
Characteristics:	Mifflin-St Jeor based caloric estimate with activity-level multipliers.
Requirement Description:	Guide nutritional planning
Requirement Priority:	Medium

Requirement ID:	RF11
Requirement Name:	Target heart rate zones
Characteristics:	Age-adjusted HRmax calculation with customizable zone percentages.
Requirement Description:	Define safe exercise intensity
Requirement Priority:	Medium

Requirement ID:	RF12
Requirement Name:	Dehydration risk score
Characteristics:	Composite risk score algorithm combining objective and subjective inputs.
Requirement Description:	Early detection of dehydration
Requirement Priority:	Medium

Requirement ID:	RF13
Requirement Name:	Body Surface Area (BSA) calculation
Characteristics:	Du Bois BSA computation for precision dosing and fluid planning.
Requirement Description:	Calculate BSA for dosing and fluid needs
Requirement Priority:	Medium

Requirement ID:	RF14
Requirement Name:	Ideal Body Weight (IBW) estimation
Characteristics:	Devine IBW estimation with sex-specific coefficients.
Requirement Description:	Assess target weight
Requirement Priority:	Medium

Requirement ID:	RF15

Requirement Name:	Adjusted drug dose for renal impairment
Characteristics:	Dynamic dose adjustment module factoring in renal clearance.
Requirement Description:	Modify dose based on eGFR
Requirement Priority:	Medium

Requirement ID:	RF16
Requirement Name:	Basal Metabolic Rate (BMR) calculation
Characteristics:	Harris-Benedict BMR calculator with gender-specific constants.
Requirement Description:	Estimate resting energy expenditure
Requirement Priority:	Medium

Requirement ID:	RF17
Requirement Name:	Pressure ulcer risk scoring (Braden Scale)
Characteristics:	Characteristics: Braden Scale scorer with auto-threshold risk classification and guidance.
Requirement Description:	Quantify risk of skin breakdown
Requirement Priority:	Medium