
Software Requirements

Specification

for

Day Health Manager

Version 1.1

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Revision History

| Name | Date | Reason For Changes | Version |
|-----------------|---------|------------------------------------|---------|
| Zachary Nielsen | 2/10/15 | Initial creation | 1.0.0 |
| Zachary Nielsen | 3/07/15 | Customer request | 1.1.0 |
| Daniel Hudy | 4/28/15 | Revision after Session App changes | 1.2.0 |

1. Introduction

1.1. Purpose

The Trillium Health Day Health Manager is a system primarily used to assist Day Health staff in the tracking and care of patients in their Day Health program by multiple means. An important assistive activity the system provides is to digitize what are currently physical artifacts such as patient assessments, care plans, and patient sign in/out. As an improvement to the current physical workflow, the system will automate tracking of individuals through the program. In addition, the system will assist the staff in clerical duties such as billing, report generation, overseeing compliance with patients care plans, and providing tools to assist in the case of an audit.

The system will accomplish these goals through the implementation of a desktop interface, database, and mobile application. The Clinician Portal will assist the Day Health staff in the creation and retrieval of their electronic medical records, billing, and report generation. The database will persistently track the status of the individuals enrolled in their program, and the mobile application will assist patients with signing in and out.

1.2. Document Conventions

This document has been broken into three parts under most sections to cover the three fundamental parts of the application, the database, the Clinician Portal, and the session application. This document is modeled after the SRS template from the Software Requirements and Architecture class [A:1]. Throughout the document we reference different appendices, these references will be noted with the following convention: [Appendix Letter:Item Number]. For example the notation for referencing item one in appendix A (The SRS Template) would be [A:1].

1.3. Intended Audience and Reading Suggestion

The intended audience of this document is all major stakeholders which include the development team, the project owner, the project customer, the senior project advisor (Professor Hawker), and anyone evaluating the project. It is recommended that you check out our team's website and the documents hosted there for better background on the project, process, and the team.

1.4. Project Scope

The scope for this project includes everything Trillium needs to replace their current system with our system in addition to a couple of extra features. The scope primarily consists of three parts, the database, the clinician portal, and the session application. The three of those parts each have a distinct scope.

The database must be able to track all of the data that Trillium is looking to store. A huge part of this involves scanning and storing documents on a per patient basis. Each document may have different pieces of data that need to be tracked in the database. The database will be in charge of keeping track of what pieces of data each document is associated with as well as storing each instance of that data that has been input. The database will also store session data from each of Trillium's patient sessions. This includes everything from departure and arrival times, session notes, and individual session notes. More specifics on data to be stored can be found in the product features section.

The clinician portal is the primary user interface for our system. This will be a web application accessible from any compatible web browser. The clinician portal has 3 major parts: patients, sessions, and statistics/billing. The patients section will be where the user can add, modify, or check any patient data stored in the system. This includes basic functionality such as adding a new patient, adding a new scanned document to a patient, or checking on a patient's basic info. The session section is where a user can go to add, modify, or check on any session data. This includes functionality such as scheduling a new session, modifying a session leader, or checking which classes are scheduled on a specific day. The third basic part is statistics/billing. The statistics/billing section will be where the user can find tools that are able to run tracking associated with patient data and billing. This may involve a tool that can get the patients that are billable for the week or similar tools.

The session application is used by session leaders to standardize attendance tracking and session note-keeping. The session application will primarily be used to keep track of patients signing in to sessions. The session application will interface with a fingerprint scanner that the user will need to use to sign into a session. This gives Trillium a unique and precise timestamp for each individual that will allow them to determine how long a patient has been at each session.

1.5. References

| Title | Corresponding File/Address |
|--------------|-------------------------------------------------------------------------------------------|
| Team Website | http://www.se.rit.edu/~foryourhealth/ |

2. Overall Description

2.1. Product Perspective

2.1.1. Database

Currently Trillium health uses largely paper forms and sharepoint to manage their patients care. This has been a less than an ideal solution, but no good medical software systems exist for group settings. The database's role will be to host relevant documents and relate patient and clinical information in a meaningful way.

2.1.2. Application

A clinician portal is required to present and organize the contents of the database. This is the user-facing aspect of the system and will be implemented with special consideration given to usability. A successful implementation of this user interface will above all provide faster access to, and better presentation of, the clinic's data.

2.1.3. Session App

Another application is necessary to allow patients to easily check in to Day Health and into specific sessions. This will allow the patients to verify their attendance using their fingerprints.

2.2. Product Features

2.3. Install

2.3.1.1. A way for trillium to install the database

2.3.1.2. A way for trillium to install the server app

2.3.1.3. A way for trillium to install the front end application

2.3.2. Database

2.3.2.1. Stores previous states of all tables with all changes made to them

2.3.2.2. Can store patients signing in for the day

2.3.2.3. Can store patients signing out for the day

2.3.2.4. Can store patients signing in for sessions

2.3.2.5. Can store patients signing out for sessions

2.3.2.6. Can store new documents in the database

2.3.2.7. Store structure of new documents created

2.3.2.8. Can store patient care plans

2.3.2.9. Can track reviews of care plans

2.3.2.10. Can track approval of care plans

2.3.2.11. Can store care plan updates and changes

2.3.2.12. Can store tracks

2.3.2.13. Can store classes

2.3.2.14. Can link patients to classes

2.3.2.15. Can store schedules

- 2.3.2.16. Can store sessions
- 2.3.2.17. Can store all data associated with sessions
- 2.3.2.18. Can store group notes for sessions
- 2.3.2.19. Can store individual notes for session
- 2.3.2.20. Can link users to tracks
- 2.3.2.21. Can calculate Assessment timeline
- 2.3.2.22. Can calculate who is billable based on dates
- 2.3.2.23. Can keep track of what claims has been sent for
- 2.3.2.24. Can keep track of claims that have been accepted or denied
- 2.3.2.25. Will have stored procedures for calculations within the database
- 2.3.3. Clinician Portal
 - 2.3.3.1. Will have a way to configure external data requests
 - 2.3.3.2. Will have a way to get external data through configured connections and scripts
 - 2.3.3.3. The user shall have access to a "Start Screen"
 - 2.3.3.4. The user shall be able to a view a Metrics page, with the following displayed...
 - 2.3.3.4.1. - Number of Patients enrolled
 - 2.3.3.4.2. - Percentage of service encounters billed
 - 2.3.3.4.3. - Total Dollars billed
 - 2.3.3.4.4. - Average percentage attendance for ADHP
 - 2.3.3.4.5. - Net Revenue
 - 2.3.3.4.6. - Receivables for the past 90 days
 - 2.3.3.4.7. - HIV Health aggregated
 - 2.3.3.5. The user shall have access to a Patient page, with the following displayed...
 - 2.3.3.5.1. - Viewing of the Patient's care plans
 - 2.3.3.5.2. - Links to other patient Documents
 - 2.3.3.5.3. - Session attendance
 - 2.3.3.5.4. - Billing information
 - 2.3.3.6. The Portal will display a list of sessions
 - 2.3.3.7. The user shall be able to select a particular session to see more details
 - 2.3.3.8. The user shall be able to see Session information
 - 2.3.3.8.1. - Facilitator information
 - 2.3.3.8.2. - Time and scheduling
 - 2.3.3.8.3. - Attendance
 - 2.3.3.8.4. - Group and Individual notes
 - 2.3.3.9. Support for entering and viewing patient assessments
 - 2.3.3.9.1. - Nursing, Nutrition, Health Literacy, Care Management, Behavioral Health, etc.
 - 2.3.3.9.2. The user shall be able to create new assessment types
 - 2.3.3.10. The user shall be able to conduct the Care-plan process
 - 2.3.3.10.1. - Perform Care-plan Review
 - 2.3.3.10.2. - Approve a Care-plan
 - 2.3.3.10.3. - View Care-plan history
 - 2.3.3.10.4. - Make updates or changes to a Care-plan

- 2.3.3.11. The Portal shall support auditing of Documents and other data with the following...
- 2.3.3.12. - Tracking addition of new documents or data
- 2.3.3.13. - Allowing and Tracking changes to existing documents or data
- 2.3.3.14. - Allowing and Tracking deletions of existing documents or data
- 2.3.3.15. - Reports which show auditing history, per user or per patient.
- 2.3.3.16. - Export of auditing histories
- 2.3.3.17. Clearly demonstrate the link between patient goals and sessions.
- 2.3.3.18. Either catalog document locations, or display the documents in the application.
- 2.3.3.19. Add fingerprints to the database for each user
- 2.3.4. Session App
 - 2.3.4.1. Maintain a local copy of patient fingerprints for off-site purposes
 - 2.3.4.2. Fingerprint scanner sign-in and sign-out for the day and individual sessions
 - 2.3.4.3. Has a backup way to sign-in and out in case of fingerprint scanner error
 - 2.3.4.4. Ability for facilitator to override sign-in or out in case of fingerprint or backup error
 - 2.3.4.5. Overview of attendance for particular day or session
 - 2.3.4.6. Ability for facilitator to create a new session

2.4. User Classes and Characteristics

IT Personnel:

Technical Skill : Has full understanding of the system, and working knowledge of SQL
Frequency of Use : Low
Education Level : At least formal training or some college
Privileges : Administrator privileges - has access to all parts of the system and can directly access the database
Experience with System : High
Product Functions: Run database queries, add new forms

Clinician

Technical Skill: Low to medium
Frequency of Use: Multiple times per day
Education Level: Non-specific
Privileges: Read access to all documents, write access only upon creation or special cases.
Experience with System: Medium
Product Functions: View and interpret data and documents, create and add new documents.

Patient

Technical Skill: Low
Frequency of Use: Multiple times per day
Education Level: Not Specified

Privileges: Session/Daily attendance through fingerprint scanner
Experience with System: Low
Product Functions: Check in to session or day through fingerprint scanner.

Facilitator

Technical Skill: Low to medium
Frequency of Use: Multiple times per day
Education Level: Non-specific
Privileges: Read access to session attendance
Experience with System: Medium
Product Functions: Confirm session attendance taken through fingerprint scanner.

2.5. Operating Environment

2.5.1. Database

The database will exist on a Microsoft Windows Server That runs MSSQL 2008. This server will only serve requests from inside trillium.

2.5.2. Application

The main user application will be built as a web-based system. Users will access it through a browser and login window. The spring MVC model will be used as a base.

2.5.3. Session App

The session application will be hosted on laptops with Windows OS.

2.6. Design and Implementation Constraints

2.6.1. Database

Database needs to be available to internal sources for queries. The customer would like the database to be able to be easily modified in the future for other teams to upgrade the system or do work on it.

2.6.2. Application

Features need to be supportable in a web-application, security features and security design must address this reliance on the web. Additionally, both the design and the implementation needs to be usable by all clinicians.

2.6.3. Session App

2.7. User Documentation

2.7.1. Database

User documentation will consist of the Database Schema and how to guide for running database setup script.

2.7.2. Application

The application shall have tutorial documentation, for the purpose of educating new users as well as acting as a reference. Clear procedures and proper protocol must be explained in detail, as often these tasks must respect both legal and business concerns. These procedures shall be presented in step-by-step instructions which are accompanied by both screenshots and in-application tooltips. The goal here is to produce an interface which can self-teach its own practice to any first time users.

2.7.3. Session App

User documentation will be limited on the session application as this is intended to be an internal attendance verification/recording and note taking application. Navigation will be clearly marked and tool tips will be used to guide new facilitators.

2.8. Assumptions and Dependencies

2.8.1. Database

Use of MS-SQL depends upon a Microsoft Windows operating system.

2.8.2. Application

Dependent on Trillium's Local Area Network. Will also depend upon the functioning of the "Spring" model, upon which the Clinician Portal is being built(the customer already has experience working with "Spring"). Assume user's are capable of using internet browsers. Assume that Day-Health continues to track patients and sessions in much the same way they do now.

2.8.3. Session App

Fingerprint scanner is being built using customizations to the Person ID software offered by 360 Biometrics. We are working through their representative Pinky Thakkar to ensure that our software and database integrates smoothly with Person ID. We are assuming that by working closely with their development team we will be able to lower the chance of having large integration issues.

3. System Features

Use Cases

| Primary Actors | ID | Name |
|-----------------------|-----------|-------------------------------------------------------------|
| Clinician | DHM_UC_1 | A clinician logs in |
| Clinician | DHM_UC_2 | A clinician logs out |
| Clinician | DHM_UC_3 | A clinician adds a new patient |
| Clinician | DHM_UC_4 | A clinician adds a patients care plan |
| Clinician | DHM_UC_5 | A clinician updates a patients care plan |
| Clinician | DHM_UC_6 | A clinician views a patients care plan |
| Clinician | DHM_UC_7 | A clinician views a patients session attendance |
| Clinician | DHM_UC_8 | A clinician views a patients medical assessments |
| Clinician | DHM_UC_9 | A clinician adds a document template to the system |
| Clinician | DHM_UC_10 | A clinician edits an existing document template |
| Clinician | DHM_UC_11 | A clinician views a document template in the system |
| Clinician | DHM_US_12 | A clinician deletes a document template from the system |
| Clinician | DHM_UC_13 | A clinician adds a class to the system |
| Clinician | DHM_UC_14 | A clinician edits a class in the system |
| Clinician | DHM_UC_15 | A clinician views a class in the system |
| Clinician | DHM_UC_16 | A clinician deletes a class from the system |
| Clinician | DHM_UC_17 | A clinician creates an instance of a document |
| Clinician | DHM_UC_18 | A clinician edits an instance of a document |
| Clinician | DHM_UC_19 | A clinician views an instance of a document |
| Clinician | DHM_UC_20 | A clinician deletes an instance of a document |
| Clinician | DHM_UC_21 | A clinician views the audit history of a document |
| Clinician | DHM_UC_22 | A clinician prints a document instance |
| Clinician | DHM_UC_23 | A clinician assigns classes to a patient based on CCP |
| Clinician | DHM_UC_24 | A clinician views overall program statistics |
| Clinician | DHM_UC_25 | A clinician navigates the Clinician Portal |
| Patient | DHM_UC_26 | A patient signs in for the day |
| Patient | DHM_UC_27 | A patient signs out for the day |
| Clinician | DHM_UC_28 | A clinician overrides the patients sign out for the day |
| Patient | DHM_UC_29 | A patient signs in for a session |
| Patient | DHM_UC_30 | A patient signs out of a session |
| Facilitator | DHM_UC_31 | A facilitator overrides the patient sign in for the session |

| | | |
|--------------------|-----------|--------------------------------------------------------------|
| Facilitator | DHM_UC_32 | A facilitator overrides the patient sign out for the session |
| Facilitator | DHM_UC_33 | A facilitator creates a new session |
| Facilitator | DHM_UC_34 | A facilitator ends a session |
| IT | DHM_UC_36 | An IT person runs a query on the database |
| IT | DHM_UC_37 | An IT person edits an external data source config |
| IT | DHM_UC_38 | An IT person configures a new data piece |
| Clinician | DHM_UC_39 | A clinician runs a billing report |
| Clinician | DHM_UC_40 | A clinician marks a billing as sent |
| Clinician | DHM_UC_41 | A clinician updates a billing status |

See external Use Cases document for actual use cases with their detailed descriptions.

4. External Interface Requirements

4.1. User Interfaces

4.1.1. Clinician Portal

As a web-based application, will be the primary channel through which users access or modify any information in the database. Shall rely on common web-application standards, specifically AJAX and require users to access through a browser. The interface must be easy to learn and navigate quickly.

4.2. Hardware Interfaces

4.2.1. Session Application

The session application requires an external fingerprint scanner supported by the custom version of Person ID.

4.3. Software Interfaces

4.3.1. Clinician Portal to Database

4.3.2. Session Application to Database

4.3.3. Person ID to Database

4.4. Communications Interfaces

4.4.1. The database will communicate via an encrypted remote connection using SSL.

5. Other Nonfunctional Requirements

5.1. Performance Requirements

5.1.1. Database

5.1.1.1. The database shall be available 99% of the time during business hours

5.1.1.2. The database shall be available 95% of the time during non-business hours

5.1.1.3. No Database query shall take more than 5 seconds with only one database connection active

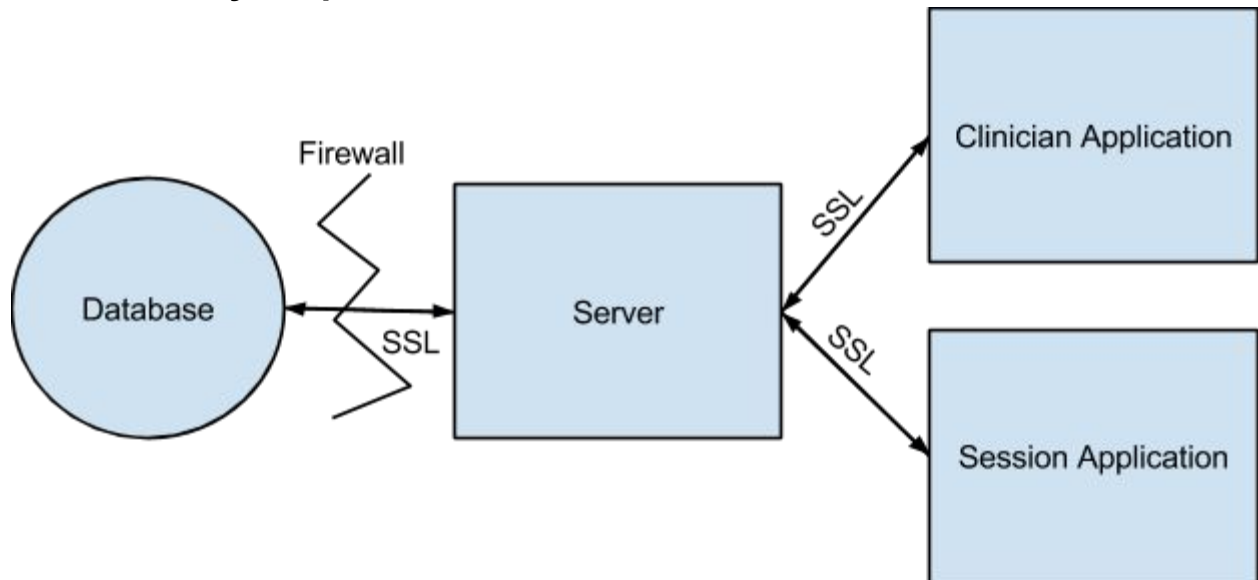
5.1.1.4. On average a database query shall take less than .5 seconds with only one database connection active

- 5.1.1.5. No database query shall take more than 10 seconds while less than 25 database connections are active
- 5.1.1.6. On average a database query shall take less than 2 seconds while less than 25 database connections are active
- 5.1.2. Application
 - 5.1.2.1. No page shall take more than 2 seconds to access with only one user online
 - 5.1.2.2. On average no page shall take more than .5 seconds to access with only one user online
 - 5.1.2.3. No page shall ever take more than 5 seconds to access
 - 5.1.2.4. On average no page shall take more than 2 seconds to access
 - 5.1.2.5. The clinician portal shall be accessible via an internet connection 99.9% of the time during business hours
- 5.1.3. Session App
 - 5.1.3.1. Fingerprint scanning shall recognize registered users 95% of the time
 - 5.1.3.2. Fingerprint scanning shall return results within 1 second
 - 5.1.3.3. The Session app will be operational 99.99% of the time regardless of an internet connection

5.2. Safety Requirements

- 5.2.1. Database
 - 5.2.1.1. Data from the database will never be transmitted to unauthenticated sources
- 5.2.2. Application
 - 5.2.2.1. The clinician application will never disclose patient information to users that are not authorized to see it.
- 5.2.3. Session App
 - 5.2.3.1. The session app will never disclose Patient information to users that are not authorized to see it.

5.3. Security Requirements



5.3.1. Database

5.3.1.1. The database must be encrypted at rest

5.3.1.2. All request and data transfer between the server in the database must be done over an SSL connection

5.3.1.3. The database must only be accessible by devices on the same network

5.3.2. Application

5.3.2.1. All communication between the server and Clinician Application will be done over SSL.

5.3.3. Session App

5.3.3.1. All patient information stored locally on the computer running the session app must be encrypted

5.3.3.2. All communication between the server and Session app will be done over SSL

5.4. Software Quality Attributes

5.4.1. Database

5.4.1.1. Database is normalized

5.4.1.2. AJ gives approval of database schema

5.4.2. Application

5.4.2.1. Clinician application is rated at % or above by at least 85% of clinicians for aesthetics

5.4.2.2. Clinician application is rated at % or above by at least 80% of clinicians for ease of use

5.4.2.3. Clinician application is rated at % or above by at least 90% of clinicians for ease of learning

5.4.3. Session App

5.4.3.1. Session app is rated at % or above by at least 85% of facilitators for aesthetics

5.4.3.2. Session app is rated at % or above by at least 80% of facilitators for ease of use

5.4.3.3. Session app is rated at % or above by at least 90% of facilitators for ease of learning

Appendix A: Glossary

1. The term “Clinician Portal” or “CP” refers to the web-based user interface that most clinic workers will use to interact with the database. This may be referred to as the “Desktop Application” in older documentation.