Ethan Fleming, Alex Staley, Long Vo, Tommy Ngo, Trent Wilson, Carl Bunt

The ChocAn Data Center

Requirements Document

1   Introduction

The Chocoholics Anonymous (ChocAn) simulator is a software suite designed for the facilitation of billing and service management for ChocAn. The ChocAn Data Center is the application which will house and maintain the data associated with the services provided by the ChocAn simulator. The Data Center enables *managers* associated with ChocAn to compile, store and manipulate data associated with ChocAn *members* and service *providers*. The Data Center will also allow providers to give ChocAn members their medical services, tracking services rendered and fees collected over time.

1.1   Purpose and Scope

This document describes the required functionality for the minimal viable product of the ChocAn Data Center. Both user requirements and system requirements are specified and categorized as being functional or non-functional. The scope extends to all requirements for the ChocAn Data Center, including how it will interface into the larger ChocAn Simulator. Components of the ChocAn Simulator developed elsewhere are considered out of scope.

1.2   Target Audience

This document is intended to be read by the system engineers who will implement the ChocAn Data Center as well as representatives of the system customer, ChocAn, who will validate that the given specifications meet the contract requirements. A high-level statement of requirements is provided for the end-users and customers while a more detailed system specification is provided for system developers.

1.3   Terms and Definitions

1.3.0   ChocAn Simulator:

The full software suite which the end-user will experience and interact with, and to which the

ChocAn Data Center provides its functional services. This is not part of the scope of the software to be

described by this document.

1.3.1   ChocAn Data Center:

The application to be produced which meets the specifications described by this document.

1.3.2   Member:

A subscriber of ChocAn who pays the organization's required monthly fee and obtains services

from providers recognized by ChocAn.

1.3.3   Provider:

A health care professional who provides services (ref: sec 1.3.8) for ChocAn members. These

providers can be *dieticians, internists, exercise specialists, addiction treatment specialists* or other care

entities recognized by ChocAn. Any provider can access provider services through the *provider terminal*.

1.3.4   Manager:

An individual working for ChocAn who is responsible for handling ChocAn transactions. They

can request the report for any member or provider as well as the manager's report at any time through the

manager terminal. They can also add, remove, and edit the records associated with members and

providers.

1.3.5   Terminal:

The interface used by an end-user to interact with the ChocAn simulator.

1.3.5.1 **Provider terminal:**   The terminal to be used only by *providers.*

1.3.5.2 **Manager terminal:**   The terminal to be used only by *managers.*

1.3.6 I.D. Number:

A 9-digit identification number associated with a ChocAn-affiliated entity.

1.3.6.1 *Member number:*   The I.D. number associated with a *member*.

1.3.6.2 *Provider number:*   The I.D. number associated with a *provider*.

1.3.7 I.D. Number Status:

The status associated with validating an I.D. number.

1.3.7.1 *Validated:*   An I.D. number that is usable to access an account.

1.3.7.2 *Invalid:*   An incorrectly formulated or unused I.D. number.

1.3.7.3 *Suspended:*   A status associated with an I.D. number belonging to a member who has been suspended (e.g. by having dues outstanding with ChocAn).

1.3.8 Service:

A consultation or treatment performed for a ChocAn member by a recognized provider that can be billed to ChocAn.

1.3.8.1 *Service code:*   The 6-digit code associated with a predefined service.

1.3.9 Provider Directory:

A list of *service codes* and their associated service names and fees, provided in a file format.

1.3.10 Interactive Mode:

A mode of the ChocAn Data Center that allows *manager* additional functionality to modify providers' and members' records.

1.3.11 Member Report:

A summary of the services obtained by a member over the past week, written to a file.

1.3.12 Provider Report:

A summary of the number of services billed by a provider over the past week, written to a file and sorted by the order which each service was received.

1.3.13 Summary Report:

A summary of the providers and associated total fees to be paid by ChocAn over the past week.

2   Product Overview

The ChocAn Data Center will be used by the manager or a provider, at the appropriate terminal, to manage the data associated with ChocAn's members, providers, services and associated fees. Implementation of the aforementioned terminals as well as the associated electronic banking services for billing purposes are not within the scope of this application.

Providers should be able to bill ChocAn for a specified service to a given member, and view a provider directory of all predefined services.

Managers should receive a weekly summary report of ChocAn's accounts. In interactive mode, they should also be able to view, add, remove and edit members' and providers' records and information, and view summary reports on demand.

In addition to the manager's summary report, the Data Center should issue weekly reports to be sent to members and providers. The communication of these reports to their respective addresses (i.e. via email to members and providers) is not part of the scope of this program. All reports will be written to files.

2.1   Users and Stakeholders

2.1.1   End Users:

The end users of this software are ChocAn managers and ChocAn service providers (ref: sec. 1.3) who interface with the Data Center via their respective terminals. Implementation of the terminals themselves are outside the scope of this software; they are modeled here as sharing a screen and keyboard.

2.1.2   System Managers:

Long-term system management is the responsibility of the IT staff hired or contracted by ChocAn for that purpose.

2.1.3   System Owners:

Ownership of the system is held by the developers who designed and created the ChocAn Data Center.

2.1.4   External Stakeholders:

Apart from the above defined end users, primary stakeholders with an interest in this software package include:

- ChocAn members and their families
- Employees of ChocAn
- Human resources employees of ChocAn service providers
- Accounting department employees of ChocAn service providers
- Board members of ChocAn

2.2   Use Cases

2.2.1   View Member Record:

In this case, a provider or a manager views a member's record. The record contains the member's name, I.D. number, street address, city, state, and zip code. If the operator is a manager, and if the system is operating in interactive mode (ref: sec 2.2.3), the operator may choose to edit this data.

2.2.2   View Provider Record:

In this case, a provider or a manager views a provider's record. The record contains the provider's name, number, street address, city, state, and zip code. If the operator is a manager, and if the system is operating in interactive mode, the operator may choose to edit this data.

2.2.3   Enter Interactive Mode:

Interactive mode is to be used exclusively by the manager. Upon entering interactive mode, the manager can add, remove and update members' and providers' account information. They can also add, remove and update data associated with services offered by ChocAn providers.

Changes made in interactive mode should be reflected throughout the database used to generate weekly reports and the provider directory.

2.2.3.1 *Add Member***:**   A manager creates an account for a new ChocAn member.

2.2.3.2 *Update Member***:**   A manager updates an existing ChocAn member's information.

2.2.3.3 *Remove Member***:**   A manager removes the account of a ChocAn member who has resigned.

2.2.3.4 *Add Provider***:**   A manager creates an account for a new ChocAn service provider.

2.2.3.5 *Update Provider***:**   A manager edits information associated with a ChocAn service provider.

2.2.3.6 *Remove Provider***:**   A manager removes the account associated with a ChocAn service provider.

2.2.3.7 *Add Service***:**   A manager defines a new service to be provided to ChocAn members by registered providers.

2.2.3.8 *Update Service***:**   A manager edits existing information associated with services.

2.2.3.9 *Remove Service***:**   A manager removes a service that is no longer offered by any ChocAn service providers.

2.2.4   Compile Member Report:

In this case a manager, in interactive mode, requests that the system generate an individual member's report. Functionality described in sections 2.2.3.1-3 is not available here; rather, compiling the report will enable it to be extracted and shared with a member.

2.2.5   Compile Provider Report:

In this case a manager, in interactive mode, requests that the system generate a provider's report for a given service provider. Functionality described in sections 2.2.3.4-6 is not available here; rather, compiling the report will enable it to be extracted and shared with a provider.

2.2.6   Compile Summary Report:

In this case a manager, in interactive mode, requests that the system generate the summary report. Data included should be updated continually as changes are made in interactive mode and as services are logged via the provider terminal.

2.2.7   Bill a Service:

In this case, a provider bills ChocAn for a specified service provided to a ChocAn member. This should occur at the time the service is logged. Service fees will be immediately added to totals used to generate provider and summary reports.

2.2.8   View Provider Directory:

In this case, a provider requests to view the provider directory. The directory shall be retrieved from a shared access file that does not require entering interactive mode.

3   Functional Requirements

This section encompasses the specifications that shall be met for the ChocAn Data Center application to be useful to the end-users. These specifications are first listed formally in Section 3.1 as the application features the Data Center shall provide to the ChocAn simulator (i.e. the user requirements). Section 3.2 describes the system requirements, which provide a more detailed specification of the user requirements.

3.1   Functional User Requirements

3.1.1   Provider Terminal Functionality:

3.1.1.1 *Provider login:*

Providers shall be able to enter their provider number to log in so that services rendered and recorded during a terminal session can be attributed to the correct provider.

3.1.1.2 *Service billing:*

Providers shall be able to bill ChocAn for a service provided to a member using the associated service code and member I.D. number.

3.1.1.3 *View provider directory*:

Providers shall be able to request a file containing the provider directory (ref: sec. 3.2.1.2) at any time, even during the hours managers' interactive mode is unavailable.

3.1.1.4 *Verify services*:

Providers shall be able to verify services by completing a form which includes: the current date and time, the date the service was provided, member name, member number, service code, and fee to be paid.

3.1.1.5 *Verify fees weekly*:

Providers shall be able to submit total fee data each week in order to verify the amount ChocAn will pay the provider.

3.1.2   Manager Terminal Interactive Mode Functionality:

Interactive mode is available exclusively to managers. Upon entering interactive mode, the manager can add, remove and update members' and providers' account information. They can also add, remove and update data associated with services offered by ChocAn providers.

Changes made in interactive mode should be reflected throughout the database used to generate weekly reports and the provider directory.

3.1.2.1 *Add new members:*

The manager shall be able to add new members to the database.

3.1.2.2 *Update member data:*

The manager shall be able to update information of existing members.

3.1.2.3 *Remove members:*

The manager shall be able to remove existing members from the database.

3.1.2.4 *Add new providers:*

The manager shall be able to add new providers to the database.

3.1.2.5 *Update provider data:*

The manager shall be able to update provider information.

3.1.2.6 *Remove providers:*

The manager shall be able to remove existing providers from the database.

3.1.2.7 *Add new services:*

The manager shall be able to add new services to be provided to ChocAn members.

3.1.2.8 *Update service data:*

The manager shall be able to update information associated with providers' services.

3.1.2.9 *Remove services:*

The manager shall be able to remove a service that is no longer provided.

3.1.3   Main Accounting Procedure:

3.1.3.1 *Produce Weekly Reports:*

Every Friday, member, provider, and summary reports shall be written to individual files to be issued to their associated recipients.

3.1.3.2 *Request Reports:*

At any time, a manager shall be able to request the member, provider, or summary reports.

3.2   Functional System Requirements

3.2.1   Provider Terminal Functionality:

3.2.1.1 *Service billing:*

Providers should be able to verify a patient's status as a ChocAn member (validated, invalid or suspended) using the patient's member I.D. number. After a service has been performed, providers should be able to bill ChocAn for the service using the associated service code and member I.D. number.

Once a service has been logged in this way, the ChocAn Data Center will generate a body of data documenting the service. The data will be stored in a file and accessed to generate member, provider and summary reports. These data include:

- The date and time the service was logged (MM-DD-YYYY HH:MM:SS)

- The date the service was provided (MM-DD-YYYY)

- The provider I.D. number (9 digits)

- The member I.D. number of the patient who received the service (9 digits)

- The service code (6 digits)

- Additional comments (100 character limit and optional)

3.2.1.2 *Viewing provider directory:*

Available to ChocAn service providers, on demand, will be a provider directory. This directory will comprise an alphabetically ordered list of services provided by ChocAn service providers, their associated service codes, and their associated fees.

The provider directory should be able to be requested at any time via the provider terminal. Hence, it should not depend on retrieval by a manager in interactive mode, which is only available "during the day." The directory will be updated automatically in the event a manager adds, updates or removes a provider or service, and saved in a file to which the provider terminal has access.

3.2.2   Manager Terminal Interactive Mode Functionality:

The ChocAn Data Center will store member and provider information in the form of a hash table. Implementation of the hash table will include methods to add new members or providers, update member or provider information, and remove existing members or providers. Successful implementation of these methods will necessitate implementation of methods to retrieve profiles of members or providers and display member or provider information, potentially in addition to other methods.

In interactive mode, the manager should also be able to manually generate the weekly reports already generated automatically by the ChocAn Data Center: member reports, provider reports and summary reports. Data comprising said reports is described below (ref: sec. 3.3.3).

3.2.3   Main Accounting Procedure:

Every Friday at 9:00PM, member, provider, and summary reports shall be written to individual

files in preparation to be issued to their associated recipients.

3.2.3.1 *Member Report:*

The weekly member report will be written to a file in preparation to be emailed to its applicable

member. Each member report consists of the member's:

- Member name (25 characters maximum)

- I.D. number (9 digits)

- Address (25 characters maximum)

- City (14 characters maximum)

- State (2 letters)

- Zip code (5 digits)

- For each service provided:

  - Date of service provided that week (MM-DD-YYYY)

  - Provider name (25 characters maximum)

  - Service name (20 characters maximum)

3.2.3.2 *Provider Report:*

The weekly provider report will be written to a file in preparation to be emailed to its applicable

service provider. Each provider report consists of the provider's:

- Name (25 characters maximum)

- I.D. number (9 digits)

- Address (25 characters maximum)

- City (14 characters maximum)

- State (2 letters)

- Zip code (5 digits)

- Total number of consultations (3 digits)

- Total fee to be paid to the provider (up to $99,999.99)

- Service information (per service provided):

  - Date service was provided (MM-DD-YYYY)

  - Date and time service was logged (MM-DD-YYYY HH:MM:SS)

  - Member name (25 characters maximum)

  - Member number (9 digits)

  - Service code (6 digits)

  - Fee to be paid (up to $999.99)

3.2.3.3 *Summary Report:*

The weekly summary report will be written to a file for the benefit of the manager of the ChocAn

Data Center. The summary report consists of the following for each provider still awaiting payment:

- Name of the provider owed

- Number of services the provider completed

- Total fee to be paid to the provider

The summary report shall conclude with the following sums:

- Number of providers to be paid

- Total number of services completed

- Total fee to be paid to providers

4 Non-functional Requirements

This section highlights the goals that the application should work towards attaining for the end-user's overall experience of the ChocAn Data Center.

4.1 Non-functional User Requirements

4.1.1 Terminal Simulation:

Implementation of the providers and manager terminals is beyond the scope of the ChocAn Data Center. Simulation of said terminals will take place on one shared input/output system.

4.1.2 Weekly Reports:

Three classes of reports--the member reports, the provider reports and the summary report--shall be automatically generated weekly. These reports shall be available on demand via interactive mode on the manager's terminal.

4.1.3 Data Requirements:

Data storage capability shall be sufficient to store all service records, member profiles and provider information, as well as all weekly reports. Considering potential future ChocAn membership growth, either storage capacity overhead should be included up-front or the system should have expansion capability.

4.1.4 Performance Requirements:

Principal performance requirements of the system include reliable generation of weekly reports and fast and reliable communication between the provider and manager terminals and the Data Center. Contingencies for system interruptions have been factored into system components.

4.2 Non-functional System Requirements

4.2.1 Terminal Simulation:

Implementation of the provider and manager terminals is beyond the scope of the ChocAn Data Center. As specified, both terminals will be simulated by text input and output on one shared keyboard and monitor system.

4.2.2 Weekly Reports:

Reports are generated automatically every Friday at 9:00pm. As the demo meeting will (hopefully) not last longer than a week, the primary non-functional requirement with regard to the weekly reports is their ability to be generated on-demand by the manager in interactive mode. Simulation of the manager terminal shall include options to retrieve, edit, display and save reports.

4.2.3 Data requirements:

Data storage capability shall be sufficient to store all service records, member profiles and provider information, as well as all weekly reports. As simple text formats are sufficient for these data, for the purposes of this application no significant data requirements exist.

4.2.4   Performance requirements:

Fast and reliable communication between both the provider and manager terminals and the Data Center is the principal performance requirement of the system. However, implementation of the terminals themselves is beyond the scope of this application, and in any case 100% uptime is not critical for successful operation of the system, so no express performance requirements will manifest here.

Contingencies for system interruptions have been factored into system components. For example, providers submit date-of-service data because hardware or other difficulties may have prevented the provider from billing ChocAn immediately after providing the service.

5 Milestones and Deliverables

Planning the stages of the project helps identify the work breakdown, and by isolating the separate activities within the project a feasible project schedule can be set. Due to the dependencies between the four deliverables, target dates for each incremental milestone were set so that the final deliverable is completed on time. In pursuit of an appropriate schedule, consultant Professor Chris Gilmore has set milestone dates (stated below) that remain subject to negotiation.

5.1 Requirements Document

To develop the requirements document (this document), requirements analysis were performed on an unstructured Project Definition document. The requirements document comprises an overview of the product to be delivered (the ChocAn Data Center application), a detailed description of all known functional and non-functional requirements of the application, and how it will interface with other components of the ChocAn Simulator that are outside the scope of the project. Also, it includes a timeline of milestones to be reached with associated deliverables to be presented over the course of development of the product. The requirements document will be submitted for review on or before **Wednesday, October 23, 2019**. By producing an in-depth requirements document, the objectives have been more clearly defined and can be used more effectively to develop a useful and accurate design document.

5.2 Design Document

The design document comprises an outline of the considerations involved in the structure of the ChocAn Data Center, a detailed description of its anatomy, a schematic of its methods and functionality,

and the underlying structure of the data to be processed. The design document will be submitted for review on or before ***Monday, November 11, 2019*** (this date subject to negotiation).

5.3   Test Plan Document

The test plan document details the procedures used to show correct behavior of the ChocAn Data Center application. It includes a declaration of the scope of testing, a testing schedule, and a list of criteria to be satisfied by the tests. Also included is documentation of all testing performed on the systems and subsystems extant in the application. The test plan document will be submitted for review on or before ***Monday, November 18, 2019*** (this date subject to negotiation).

5.4   Project Report and Final Deliverables

The final product is composed of a stand-alone software suite designed to manage the data associated with ChocAn, its members, and its associated service providers. It includes software necessary to handle billing, data storage, and data processing associated with records of services provided to ChocAn members.

Also included in the final product is a set of slides presenting the features of the application and a ~1500-word retrospective describing the software development team's experience designing the ChocAn Data Center.

Not included in the final deliverable package is implementation of the manager and provider terminals, software required to process payment of service fees and membership dues, and an email platform dedicated to communication between ChocAn and its associated service providers. The final product will be delivered no later than ***Friday, December 6, 2019*** (this deadline is non-negotiable).