Ben Reichert

The ChocAn Simulator

Requirements Document

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1 Introduction

This project focuses on the ecosystem revolving around the Chocoholics Anonymous (hereby referred to as ChocAn) computer systems for keeping track of members and payments. This system is used to keep track of member transactions and the services they receive from ChocAn registered providers. The system is responsible for keeping track of users, providing terminals for providers to transmit data from, and storing running a ChocAn data center for centralized processing. The rest of the document covers the users of the software system, the ways the system can be used by many parties, the requirements of the system for day-to-day functioning, as well as non-functional requirements of the system.

1.1 Purpose and Scope

The purpose of this document is to provide clarity to the formal requirements and uses of the ChocAn software for reference by the customer, and developers of the system software. The system has many parts, this document's scope excludes the Provider Terminal hardware, Email delivery system, and EFT payment processing system.

1.2 Target Audience

The target audience of this document is the ChocAn representatives responsible for software input, as well as employees of Ben Reichert Software, LLC, not limited to developers and system architects.

1.3 Terms and Definitions

1.3.1 EFT

Electronic Funds Transfers: used to keep track of payments to be made between providers and ChocAn.

1.3.2 DC

ChocAn Data Center, responsible for keeping records and service transactions.

1.3.3 Terminal

The specially designed ChocAn terminal, which will include a PC along with a magnetic card reader for reading member cards. This hardware design is not the responsibility of Ben Reichert Software, LLC, and thus will not be discussed. The software that runs on this Terminal is within the scope of this project and document.

1.3.4 Provider

A provider is an institution registered with Chocoholics Anonymous that provides treatments and consultations with health care professionals, dietitians, internist, and exercise specialists.

1.3.5 MC

MC: Member Card: A plastic card embossed with the ChocAn member's name and member ID. This card has a magnetic strip with the previous information encoded on it for reading through the Terminal.

1.3.6 System

The ChocAn system as a whole, in all of it's functionality.

1.3.7 MID

Member IDentification number, a 9 digit sequential number.

2 Product Overview

The project is a software system for tracking member transactions, services, and payments. The users of this system include the member themselves, providers, and managers of the system, including but not limited to Information Technology staff and Accounts Payable Managers. A User in this environment is a single individual, or a single instance of inter process communication between computers. A Stakeholder is a user who has a say in the system, and can be affected by the system. The Terminal is outside of the scope of this document and will be designed by another party. ACME has been hired to provide the EFT (Electronic Fund Transfer) system, and this system will not be covered in this document. The ChocAn central system is described below, and is responsible for EFT files, but not for the actual processing of payments.

2.1 Users and Stakeholders

This section is used to outline those who have a stake in the software system, and the end users of the system, as well as how they will use the system.

2.1.1 Providers

Providers are the end user of the system, and are responsible for testing the software for efficient flow control, and usability. They will also be testing any software updates and provide feedback as necessary. Since they will be the primary use of the System, they will provide the most feedback to the development phase for improvements to the System. They will be required to install software updates as soon as possible, especially any patches related to security. The providers will be responsible for contacting the appropriate company for Terminal issues not related to the System.

2.1.2 Members

The members have the smallest amount of interaction with the System, however they will be receiving emailed reports of their services every week. As a member of ChocAn they will be responsible for reporting issues with this email system, as well as their MC. They will have no direct interface with the rest of the System, and therefore are removed from

the rest of the development process.

2.1.3 Hosting Staff

The staff, particular the Information Technology division of ChocAn is crucial for smooth operation of the software. They are responsible for running the physical infrastructure of the System, including but not limited to DC servers, networking, and Terminal interaction across a network. The role they play in development is providing feedback on the processing and memory efficiency of the software that runs on their systems. They are the main group responsible for deployment, so when Ben Reichert Software, LLC releases a new update, they will be responsible for installing the updated software across their systems. They will not directly interact with the software, but rather insure the software is running properly without errors, and maximum uptime during normal business operating hours.

2.1.4 Accounts Payable Manager(s)

The Accounts Payable Manager(s) get reports from the software about which providers used which services, and the corresponding amounts to reimburse the providers from the ChocAn accounts. They will be responsible for providing feedback on this functionality of the System, as any errors in account calculations could yield disastrous results for both the providers and ChocAn network.

2.2 Use cases

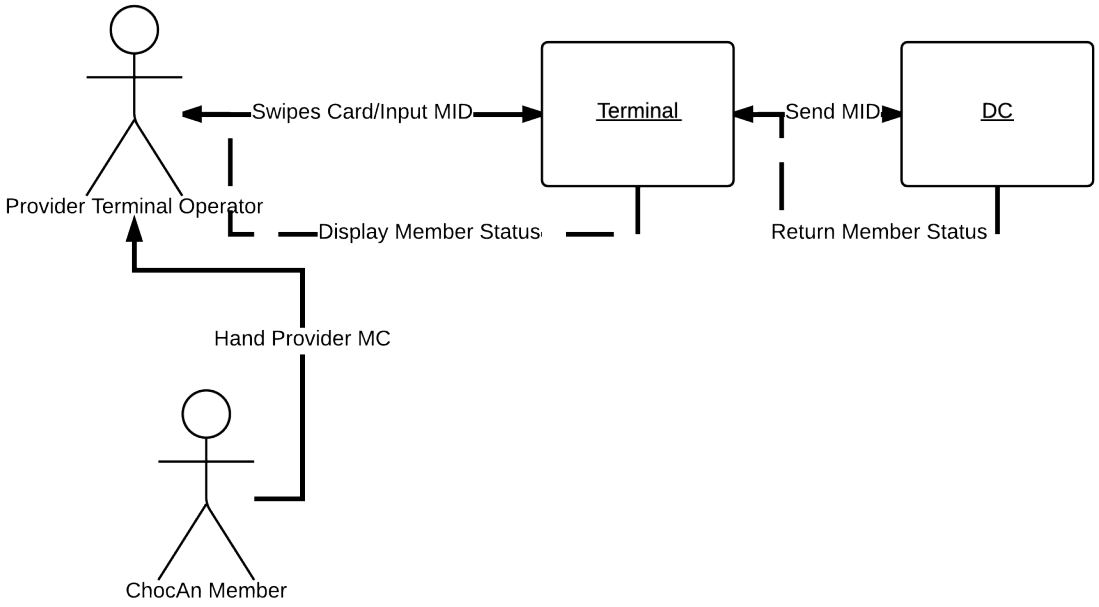
This section of the document is to show the possible use cases of the System from different perspectives, from different users and stakeholders. This section will also contain basic diagrams of possible use cases, particularly those revolving around the Provider's terminal software and it's network interactions.

2.2.1 Member receives Services

This case will happen the most frequently when a Member goes into a provider location to receive ChocAn services. The member will give their MC to the Provider Worker, who will interact with the Terminal to input information from the Member and what services they wish to receive.

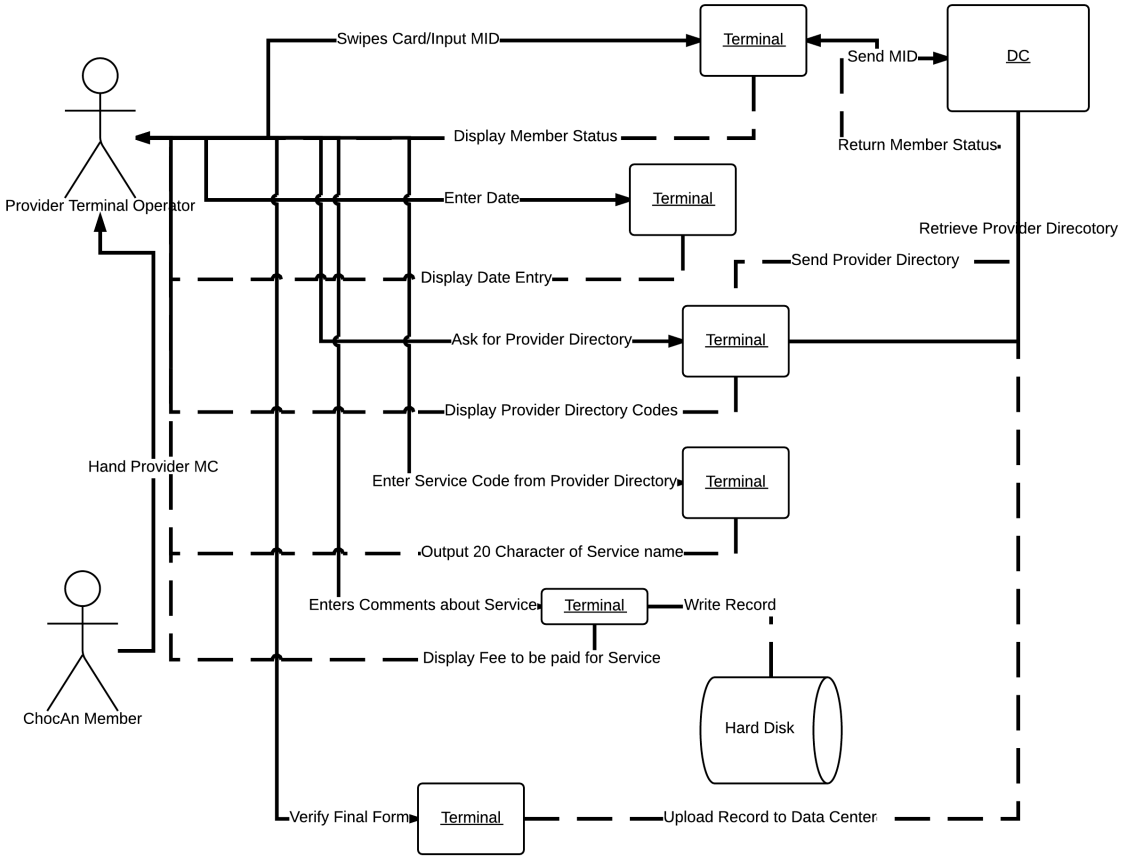
2.2.2 Basic Member Verification

This case is where the Member hands over their MC to the Provider and the Provider uses the Terminal to verify if the Member is active. Below is a diagram documenting the situation:



2.2.3 Member Provider Service Request

This case is a continuation of 2.2.2 Basic Member Verification. After the Member has been successfully verified and has an account in good status, they can then ask for services. The Provider Terminal Operator will then ask the System for a Provider directory for a service code corresponding to what the Member requires, and then save the transaction to disk. The following diagram demonstrates a single transaction (All Terminal objects in the diagram represent one physical terminal, with separate interactions of the software on the Terminal):



2.2.4 Provider Starts Terminal

This situation is when the Terminal is off, presumably after hours and it needs to be booted and logged in. The Provider Terminal Operator will turn on the machine and when prompted for their provider number, will enter their corresponding 9 digit ID number. After successful contact with the DC, the terminal will unlock functionality for day-to-day operations.

2.2.5 Report Sending

These two use cases are when a member or manager receives a report.

2.2.5.1 Member Report

A simple use case is that of when a member gets their weekly report delivered to their email. While there is little interaction required from the user aside from opening the

attached report document, the ChocAn System still has to generate the report. The main DC will search all documents based on timestamps for that week, and compile a list of services provided for each user into individual reports for sending. Then it will use an email system (outside of the scope of this project) to send the report to the corresponding email address for that user. This process is run at at Midnight on Fridays.

2.2.5.2 Accounts Payable Report

Similar to 2.2.5.1 (Member Report), except there is a special report generated specifically for the Accounts Payable Manager for ChocAn. This report will be generate at Midnight on Fridays with a summary of how to transfer reimbursement funds to each provider. This report will be emailed in the same fashion as the Member reports, but in this case only to a list of approved Accounts Payable employees.

2.2.6 Adding Member

Process is similar to 2.2.3 (Member Provider Service Request), except the Member will not have a card yet, and will be assigned a member id retrieved from a pool of free MIDs retrieved from the DC computers. The Provider will fill out a form and send it via the terminal containing specific formatting shown later in the Requirements section. This can only be done during operational hours, 8am-5pm Monday through Friday.

2.2.7 Deleting Member

At a verified Terminal at a provider, the Provider at any time can enter a MID to delete from the system. The Terminal should prompt the Provider for a reason for removing the member. This can only be done during operational hours, 8am-5pm Monday through Friday.

3 Functional Requirements

Functional requirements of the System are those necessary to the System needed to work properly at a minimum. This section of the document is a list of functional requirements that are needed to satisfy the software System. These requirements
Describe the purpose of this section and outline its contents. Only a few sentences are expected here. It may help to define a functional requirement.

3.1 Terminal

These requirements relate to the Terminal in each provider's office space, and the corresponding software running on the terminals.

3.1.1 Network Connection

The Terminal and DC must have a network connection to communicate data between providers. While this is required for the software, it is not the responsibility of Ben Reichert Software, LLC, to implement a network physically or in software (this is sourced to another company working on the project).

3.1.2 Member Verification

When a MC is swiped, the terminal shall print 'Validated' when the member's account is in good standing, 'Invalid Number' if the MID is invalid, or 'Member suspended' if the member has fees that have been owed for membership at least a month late. If the member is suspended their status goes from 'valid' to 'suspended'.

3.1.3 Service Disk Records

The following record will be created on disk for every service transaction, using this template. All input and output from the Terminal must follow these formats:
Current date and time: (MM-DD-YYYY HH:MM:SS)
Date service was provided (MM-DD-YYYY)
Provider Number (9 digits)
Member Number (9 digits)

Service Code (6 digits)
Comments (up to 100 characters, optional)

3.1.4 Provider Directory

The terminal will have access to the DC provider directory to map services to 6 digit service codes. If the DC is unavailable, the terminal shall use it's most recent locally cached provider directory to complete the transaction. The provider can ask for a provider directory at any time in the software process.

3.1.5 Fees

The terminal shall display the associate fee for a service after it has completed the transaction. Providers are responsible for totaling fees accrued during the week for reimbursement by ChocAn Accounts Payable. This weekly totally can be done through the software.

3.1.6 Transactions

Each service provided is treated as a separate transaction, and therefore the provider terminal user must swipe MC or enter the MID for each transaction, and follow the diagram show in 2.2.1.2 Member Provider Service Request.

3.1.7 Account Creation / Deletion

The terminal shall allow the provider to create or delete accounts during normal business hours (8AM-5PM).

3.2 Data Center Application

These requirements pertain to the software managing the backend server side actions, such as the database of members, payment information, etc.

3.2.1 Timestamps

The DC applications will use timestamps for information logging, in the form of DD-MM-YYYY for data entry, and UTC for logging.

3.2.2 Member Report

Each week on Friday at Midnight member reports are generated and send the member via an email service. This information is the same as what was input on initial account creation from a provider. They have the following format:
Member name: (25 characters)
Member number: (9 digits)
Member street address (25 characters)
Member city (14 characters)
Member state (2 characters)
Member zip code (5 digits)
For each service that was provided to the member, the report will contain an additional block with the following formatting:
Date of service (MM-DD-YYYY)
Provider name (25 characters)
Service name (20 characters)

3.2.3 Filenames

Member files shall be stored in the *members* directory which contains filenames as MID.txt, for example: 960456384.txt. Member reports shall be saved individually, with the name of the file being the member name followed by the date of the report. Example: BenReichert-101414.txt. The provider directory shall be a file named provider_directory.txt. EFT data is a log file with appended data in the format containing provider name, provider number, and amount to be transferred as reimbursement.

3.2.4 Adding Providers

The DC application shall allow the addition of providers during normal operating hours.

3.2.5 Provider Weekly Report

The System shall create a weekly report at midnight on Fridays that contains a list of services each provider gave to ChocAn members. The report will be emailed to the provider. The report shall contain the exact information provided from the providers form when submitting service transactions, in the date they were received by the System. The

report will contain a summary at the end of the report with the number of consultations with members and the total fees for that week. The report shall contain the following fields:

Provider name (25 characters)

Provider number (9 digits)

Provider street address (25 characters)

Provider city (14 characters)

Provider state (2 characters)

Provider zip code (5 digits)

For each service provided to an individual member, the following format will be included:

Date of service (MM-DD-YYYY)

Date and time data was received by the computer (MM-DD-YYYY HH:MM:SS)

Member name (25 characters)

Member number (9 digits)

Service code (6 digits)

Fee to be paid (up to $999.99)

The summary will be attached at the end of the individual service statements containing the following fields:

Total number of consultations with members (3 digits)

Total fee for the week (up to $99,999.99)

3.2.6 Expense Report

The Accounts payable manager shall be able to ask the System for an expense report, detailed at any time throughout the week. The report shall contain a list of every provider to be paid that week, the number of consultations each had, and the provider's fee for the week. The total number of providers who provided services, the total number of consultations, and overall fee total are printed for record keeping at the end of each week.

3.2.7 EFT

EFT data is a log file with appended data in a format containing provider name, provider number, and amount to be transferred as reimbursement. This keeps track of what

providers get reimbursement and the amount to be transferred. This will be written to disk as a file. Every evening at 9PM the Acme Accounting Services will sync the EFT data and update relevant membership records on the ChocAn DC side. Acme is responsible for financial procedures such as recording payments of membership fees, suspending members whose fees are overdue, and reinstating suspended members who have now paid what was owed.

3.3 Computer Hardware

The system shall run on either Windows computers (Windows 7 or later) or Linux systems (running kernel 3.13.0 or later). Linux is preferable for the DC component of the System, where Windows computers may be used for user-facing appliances.

4 Nonfunctional Requirements

Nonfunctional requirements are parts of the software that should be implemented as part of the System, but are not required by the System to function during operation.

4.1 Logging

The software should perform logging of every action with the software, human or system. This way malfunctions or malice on the human side can be seen when necessary.

4.2 Uptime

The software DC-side shall have 98% uptime during normal business operating hours (8AM-5PM). The software should have a 2 hour weekly maintenance window for updates on Saturdays at 8PM.

4.3 Stability

The application shall not produce unnecessary errors, and will attempt to resolve common errors. The application shall not crash on any errors. The application should log errors encountered to a central server for later diagnostics.

4.4 Terminal Identification

The terminal shall identify itself on boot and network connection based on a unique serial number to the central processing software.

4.5 Delays

There shall be no longer than 500ms delays between each transaction from terminal to servers.

4.6 Timestamps

Timestamps should be used for all logging, standardized by UTC, and shall be off by no more than 2 minutes.

4.7 Errors

Errors of any kind should be identified by the software and print a relevant corresponding message to the user. For example, if the user enters a 10 digit MID, the program should error printing “invalid length member ID number” to the Terminal.

4.8 Flow Control

The software should have intuitive flow control from a user's perspective. The software should function in a logical fashion.

4.9 Version information

The software shall present it's version and build information when prompted to for debugging and information purposes.

5 Milestones and Deliverables

This section of the document is to maintain a steady development process along a predefined timeline. Milestones are features of the application that are to be finished by a certain date. Employees who are developing the software will report to an appointed project manager on a weekly basis. Developers shall review this requirements document daily to ensure they follow specifications.

5.1 Terminal Software

The terminal software will be the first part of the project. As progress is made, a terminal application will be produced to deal with user input, as well as tying it to the DC application. Work done to complete this milestone will be development of the terminal application, coordinating with the terminal hardware company for testing, testing and QA of the software, and then end user testing.

5.1.1 Terminal Software Stage 1

Stage 1 is a fully-developed software application, sans outside influence. Testing will then commence. At this point an application should be functional, but has not yet been tested.

5.1.2 Terminal Software Stage 2

Stage 2 is when unit testing and QA departments have thoroughly gone through the testing cycle of the application.

5.1.3 Terminal Software Stage 3

State 3 is when testing has been commenced with the Terminal hardware company, and it passes acceptance tests to run on the custom hardware. The application is now ready for distribution.

5.2 Data Center Software

In parallel to the Terminal software being developed, the team will also be developing the

software to do the back-end server work. The software will go through the same states as the Terminal software. The final product of this state is a fully functioning member services application awaiting interfacing through a virtual console or a Terminal.

5.2.1 Data Center Software Stage 1

Stage 1 is a fully-developed software application, sans outside influence. Testing will then commence. At this point an application should be functional, but has not yet been tested.

5.2.2 Data Center Software Stage 2

Stage 2 is when unit testing and QA departments have thoroughly gone through the testing cycle of the application and it is now ready for distribution.

5.2.3 Data Center Software Stage 3

Stage 3 is the final state where the application is tested on the server hosting infrastructure and required to pass performance and reliability tests. When passed, the application is ready to be deployed.