**The ChocAn Simulator**

Requirements Document

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# Introduction

The following document contains the requirements specification for the contracted Chocoholics Anonymous data processing software. Chocoholics Anonymous (hereinafter referred to as “ChocAn”) is dedicated to assisting those currently suffering and/or recovering from chocolate addiction. Each member of ChocAn pays a monthly fee which entitles them to unlimited access to healthcare professionals specializing in the treatment of chocolate addiction, such as dietitians, internists, and exercise specialists. The data processing software outlined in the following document will improve the ease at which providers charge ChocAn for services, provide users with streamlined access to relevant data, and support timely payments to providers.

### 1.1 Project Summary

**Project Name:** Chocoholics Anonymous Data Processing System

**Project Customer:** Chocoholics Anonymous (ChocAn)

**Contracted Organization:** Linked Fist, LLC

**Project Team:** Samuel B, Project Manager

Alexander G, Senior Developer

Ben A, Senior Developer

Lily M, Senior Developer

Steven D, Senior Developer

Victor C, Senior Developer

**Customer Representative:** Christopher Gilmore, CIO ChocAn

### 1.2 Purpose and Scope

1.1.1 Project Scope

The scope of this project is a backend data processing system designed to:

* Store and maintain ChocAn’s membership, provider, service, and payment records.
* Distribute relevant data to approved individuals.
* Support the prompt payment of providers.

The communications software, provider terminal user interface, and payment software are not contained within this project’s scope.

1.1.2 System Purpose

1.1.2.1 Users

Individuals who benefit from and/or will be affected by the new system:

* Members
  + Upon implementation, the system shall allow members to use their membership card and/or number to receive services from participating providers. Members will also receive detailed reports of services received.
* Providers:
  + Upon implementation, the system shall allow providers to charge ChocAn for any services rendered to valid members. Providers will also receive detailed reports of services provided.
* ChocAn Management:
  + Upon implementation, the system shall allow ChocAn management to update and maintain member, provider, and service information. As well as run automated and manual reports.
* Acme Accounting Services:
  + Upon implementation, the system shall allow the approved accounting services organizations (currently Acme) to update membership status.

1.1.2.2 Functional Requirements Outline

The primary functional requirements of the system:

* Maintain membership, provider, and service records.
* Allow providers to access the service directory.
* Allow providers to validate membership status.
* Allow providers to charge ChocAn for services rendered.
* Allow accounting services to update membership status.
* Provide members and providers with weekly service reports.
* Provide ChocAn management with a weekly comprehensive report.
* Allow ChocAn management to pull reports on demand.
* Provide the bank with a weekly provider accounts payable report.

1.1.2.3 Nonfunctional Requirements Outline

The primary nonfunctional requirements:

* Written utilizing C++.
* Utilize a database to store records.
* Utilize a GitHub repository for version control.
* Provide simulated terminals for providers and ChocAn management.
* Accept keyboard input from the user.

1.1.3 Document Overview

The remainder of the document will outline specific requirements for the new data processing system; it will be organized as follow:

* Section 2: Product Overview
  + This section will define the system’s functionality as it relates to stakeholders and users.
* Section 3: Functional Requirements
  + This section will define the system’s features, functions, and behavior.
* Section 4: Nonfunctional Requirements
  + This section will define the system’s product, organizational, and external requirements.
* Section 5: Milestones and Deliverables
  + This section will define the project milestones and the system deliverables.

### 1.3 Target Audience

The target audience for this requirement document:

* ChocAn management, specifically ChocAn CIO Christopher Gilmore.
* Linked First’s project team in charge of this contract.

### 1.3 Terms and Definitions

| **Term** | Definition |
| --- | --- |
| **ETF** | Electronic Funds Transfer |
| **Terminal** | A hardware device that handles the input and display of data |
| **Encode** | To convert information into a particular form. |
| **Interface** | A program enabling a user to communicate with the system. |
| **Stimulus** | Item and/or action used to evoke a particular system process. |
| **Database** | A structured set of data stored persistently. |
| **Credentials** | Any object that authenticates the identity of an individual. |
| **Waterfall Development method** | A development methodology in which each process is completed before flowing to the next. |

# Product Overview

The purpose of this overview is to give a high-level description of the functionality of the ChocAn Simulator, outline the scope and limitations of the ChocAn Simulator, provide definitions for the terms used in this documentation, and define the use cases for the ChocAn Simulator.

## 2.1 Users and Stakeholders

This section lists the individuals who will be using theChocAn Simulator directly, as well as individuals and organizations who may be indirectly affected by the use and implementation of the ChocAn Simulator.

* *Direct stakeholders* refers to entities involved in the day-to-day operation of the ChocAn.
  + *Chocoholics Anonymous (ChocAn)* is the organization that contracted the development of the ChocAn Simulator and are therefore the primary direct stakeholder of the software.
  + The ChocAn Simulator is distributed to *ChocAn* affiliated healthcare *providers* by a special terminal computer provided by *ChocAn*. The *users* of the ChocAn simulator refers to the healthcare professionals that will operate the computer terminal in service of ChocAn *members*. *Users* and *providers* are used interchangeably within this document, but always refers to the individual operating the terminal computer.
* *Indirect stakeholders* refer to all other individual entities affected by the use of the ChocAn Simulator.
  + *Members* refers to the individuals that pay a monthly fee to *ChocAn* and visit affiliated *providers* for healthcare services.
  + *Software engineers* refers to the entities that develop the specifications, designs, implementation, testing, and maintenance of the ChocAn simulator itself.
  + Certain billing information and reports for the purpose of payment processing is outsourced to *Acme Accounting Services*.

### 2.1.1: Direct Stakeholders

The direct stakeholders of the ChocAn Simulator are Chocoholics Anonymous (ChocAn), ChocAn affiliated healthcare professionals (providers), and the software developers and engineers behind the application itself. These entities are directly affected by the implementation and day-to-day operations of the ChocAn Simulator.

#### 2.1.1.1: Chocoholics Anonymous (ChocAn)

ChocAn is the organization that the ChocAn Simulator software is contracted for. ChocAn shall be responsible for providing all necessary hardware to the users that the ChocAn Simulator will operate on. This provided hardware shall include both the terminal computer that the ChocAn Simulator will run on and associated membership card scanners. This membership card scanner shall also allow manual digital entry. ChocAn shall also be responsible for providing members with the necessary membership cards that encode membership information with embossed nine-digit member numbers in the event the providers must manually enter the membership number due to hardware difficulties or other circumstances. The ChocAn simulator shall interface with the ChocAn Data Center to verify membership numbers and run the main accounting procedure. ChocAn shall be responsible for the communications software and designing the ChocAn provider’s terminal computer, the software needed by Acme Accounting Services, and for implementing the EFT.

#### 2.1.1.2: Users

The intended users of the ChocAn Simulator are the ChocAn affiliated healthcare providers. This includes, but not limited to, dietitians, internists, and exercise specialists. The healthcare providers will operate the ChocAn provided computer terminal and membership card scanner to enter information concerning the services provided to a ChocAn member and the members associated membership information. Providers shall also be able to request a provider directory that includes an alphabetically sorted list of service names and corresponding service codes and fees at any time. Each provider shall receive a weekly report, sent as an email attachment, that contains the list of services that the provider performed to ChocAn members. Users shall interface with the computer terminal with a standard computer keyboard.

#### 2.1.1.3: Software Engineers

Software engineers shall be responsible for the specification, design, implementation, testing, and maintenance of the ChocAn Simulator itself.

### 2.1.2 Indirect Stakeholders

The indirect stakeholders of the ChocAn Simulator are Acme Accounting Services and the members of Chocoholics Anonymous (ChocAn). These entities are indirectly affected by the implementation, use, and maintenance of the ChocAn Simulator.

#### 2.1.2.1: Acme Accounting Services

Acme Account Services shall be responsible for the financial procedures such as recording payments of membership fees. Acme shall work together with ChocAn to generate the EFT after the ChocAn Simulator transmits the relevant information to ChocAn’s Data Center. Acme shall update relevant membership records at the ChocAn Data Center each evening at 9:00 P.M.

#### 2.1.2.2: ChocAn Members

Members of ChocAn pay a monthly fee to ChocAn and are entitled to unlimited consultations and treatments from ChocAn affiliated healthcare providers. ChocAn Members shall receive a nine-digit membership number and/or an associated membership card to be scanned by the provider at the computer terminal. The member shall give the provider this membership card or membership number to the provider so that the provider can key information into the computer terminal. A list of services provided to ChocAn members by ChocAn providers shall be sent as an email attachment.

## 2.2 Use cases

The purpose of this section is to describe the number of possible interactions, or use cases, that can happen between users and the ChocAn system. Different use cases depend on a variety of factors such as who is using the system and for what purpose.

### 2.2.1 Provider Uses System to Document Appointments

| **Actors** | Provider, Member, Member ID Card, ChocAn System |
| --- | --- |
| **Description** | When the terminal turns on, the provider inputs their ID number. At any time in the day, the provider is able to look up service codes for each service provided or check in members by sliding the member’s ID card through the terminal.  After an appointment ends, the provider bills ChocAn by sliding the member’s ID card again. A record is saved to the disk at this point. The provider then verifies the details of the appointment (time, date, services rendered, etc). |
| **Data** | Provider ID, Member ID, Time, Date, Service Codes, |
| **Stimulus** | User command entered by the provider |
| **Response** | Print information to screen and write a record to disk |
| **Comments** | To avoid errors, the system should issue a confirmation before writing a record to the disk |

### 2.2.2 System Prints Weekly Reports

| **Actors** | ChocAn Manager, Provider, Member, ChocAn System |
| --- | --- |
| **Description** | At midnight on Friday, the system prints a weekly report from the week’s file of services provided.  Every member receives a report with their personal information and a list of services received, sorted by date. Every provider is emailed a report with their personal information, a list of services provided, and the total fee and number of consultations. Record of EFT data is written to disk. A summary report is sent to the manager with every provider paid that week, the number of consultations they had, and their total fee.  Manager can request an individual report at any time. |
| **Data** | List of consultations, list of members and their personal information, list of providers and their personal information |
| **Stimulus** | Timer goes off at midnight on Friday OR manager requests a report |
| **Response** | Form a report from all the information gathered for that week and write an EFT data to disk for the fee paid to providers |
| **Comments** | The system should be able to parse all of the information needed for the report quickly, consider how to organize all of this information |

### 2.2.3 Operators Manage List of Members

| **Actors** | Operators, ChocAn System |
| --- | --- |
| **Description** | An operator is able to add/delete members and update member records. An operator is also able to add/delete providers and update provider records. |
| **Data** | List of members and their personal information, list of providers and their personal information |
| **Stimulus** | User command entered by the operator |
| **Response** | Update list of members/providers and save changes |
| **Comment** | To ensure that a record doesn’t get accidentally deleted, it would be wise to have a confirmation system |

# Functional Requirements

The purpose of this section is to define what the ChocAn simulator must do, explain the specific features the ChocAn simulator carries out, cover the functions the ChocAn simulator must perform, and describe the behavior of the ChocAn simulator under a certain condition.

## 3.1 ChocAn Database

The ChocAn simulator must provide unique documentation for the provider and member to access their accounts; through input from the keyboard and output to the terminal.

Each affiliated healthcare provider that carries out services will have a ChocAn computer terminal.

Provider Format: ChocAn Computer Terminal

ID: xxx-xxx-xxx

Information will be stored on a database that contains valuable information about the member. This information will be used to determine the status of a current member and the services they were given from providers through ChocAn. Additionally, the ChocAn simulator will produce results for managers and providers alike for record keeping.

### 3.1.1 Member/Provider Credentials

Once connected to the ChocAn data center, the ChocAn simulator validates subscribed members. Below are examples of the ChocAn simulator output for different member status based on their current membership. The provider will then be informed of the member status by the terminal output.

**System Prints One-Line Display**

|  | **Terminal Output** |
| --- | --- |
| **Valid Member** | “Validated” |
| **Invalid Member** | “Invalid Number” |
| **Fees Owed** | “Member Suspended” |

Once validated, the ChocAn terminal will output the date of the service provided in the format below:

MM-DD-YYYY

### 3.1.2 Provider Directory of Services

ChocAn will provide access to the provider directory. The format is a six-digit service code that corresponds to a specific service. Below is the format of the unique ID:

xxx-xxx

A service will appear that matches the unique ID, if it’s nonexistent or wrongly formatted, then the terminal will display an error message to notify the member. Once it matches, the ChocAn terminal will display that specific service (a maximum of twenty characters) and prompt a message for validation.

One key feature will be the ability to add comments regarding the service provided. This is important because it allows additional information about the service provided.

Next, fees that are owed for that service are displayed on the terminal. As for the provider, upon request, have access to a list of service names and corresponding service alphabetically arranged. Below is an example of the format:

Current Date and Time : (MM-DD-YYYY)

Date Service was Provided: (MM-DD-YYYY)

Provider Number: xxx-xxx-xxx

Member Number: xxx-xxx-xxx

Service Code: xxx-xxx

Comments: (Optional)

## 3.2 Weekly Reports

A report for each member who used ChocAn services during the week will be created through the ChocAn simulator. Thus, healthcare officials will have records, sorted by date, containing a summary of services & information of the member. Below is an example of the file format:

Member Name:

Member Number:

Member Street Number:

Member City:

Member State:

Member Zip Code:

Date of Service:

Provider Name:

Comments:

Service Name:

This will allow faculty members to keep records about a particular member. A ChocAn simulator will display the information on the terminal. Previous information will be used to build a final document containing the necessary information for providers and managers.

## 3.3 Electronic Funds Transfer

The ChocAn simulator will create a file that contains the provider name, number, and the amount to be transferred upon request from the ChocAn manager.

# Nonfunctional Requirements

The nonfunctional requirements are the constraints of the project based on the actual performance of the software project delivered to the customer.

## 4.1 Product Requirements

Requirements on the runtime behavior of the project.

### 4.1.1 Size/ Speed Requirements

The program has no constraints regarding the size on disk or the response times of requests made to the system.

### 4.1.2 Reliability Requirements

The program delivered has no requirements regarding uptime or reliability.

## 4.2 Organizational Requirements

Constraints due to the organization delivering the program and the organization accessing the program.

### 4.2.1 Language Requirements

The program shall be entirely written in C++ due to the composition of developers assigned to the project.

### 4.2.2 Database

The program should use a database solution of a type to be determined during the design documentation phase of the project.

### 4.2.3 Environmental Requirements

The program shall run on Ubuntu 20.04.

### 4.2.4 Version Control

The program shall be version controlled using a shared Github repository.

### 4.2.5 Development Method

The program should be developed using waterfall methodology.

### 4.2.6 User/ Manager Display

The program shall simulate a provider terminal and manager terminal, using the same keyboard and screen. They do not need to be simulated simultaneously.

### 4.2.7 GUI

The program shall display the requested information as text on a monospaced terminal screen.

### 4.2.8 Input

All input with the program shall be done with a keyboard.

## 4.3 External Requirements

Constraints on the project due to regulatory concerns.

### 4.3.1 Security Requirements

Despite being healthcare adjacent, this program has no particular requirements regarding security of user data.

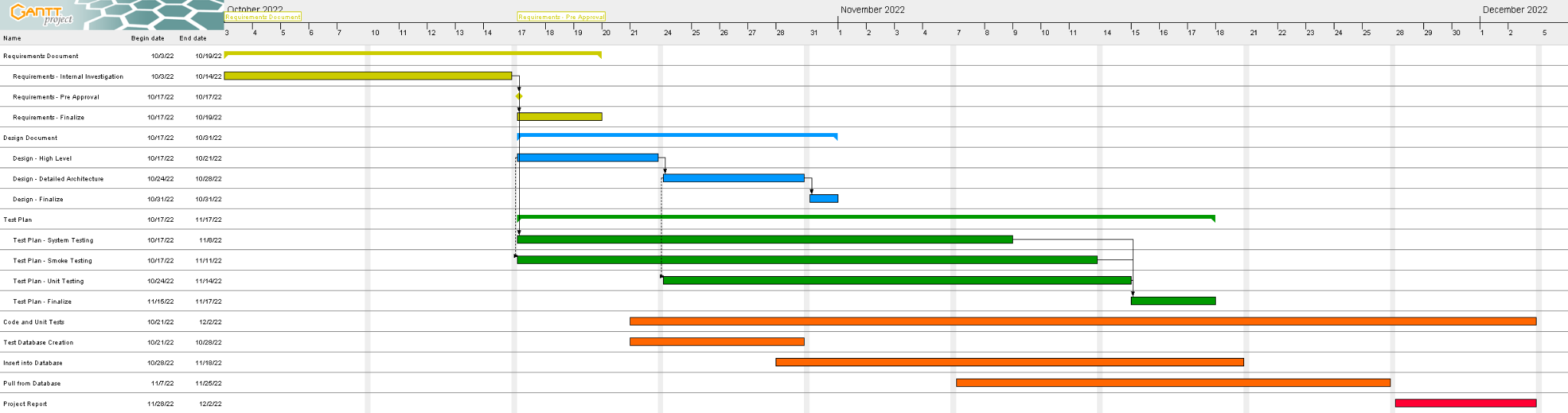
### 4.3.2 Legal requirements

There are no external regulation constraints such as HIPAA.

# Milestones and Deliverables

This section will serve to outline the roadmap of milestones and deliverables for the ChocoAn Simulator Product. This is broken up into five primary deliverables: Requirements Document, Design Document, Test Plan, Code and Unit Tests, and a Project Report.

**Figure 5.0 : Gantt Chart of Project Deliverables**



## 5.1 Requirements Document

The Requirements Document serves as the initial investigation, proposal, and outline of the customer, Chocoholics Anonymous’, project needs, as understood by Linked Fist, LLC’s software team. This deliverable will first involve an overview of the users and stakeholders of the ChocoAn Simulator Product. Next a detailed breakdown of both the function and nonfunctional requirements of the ChocoAn Simulator Product. Finally it will end with the proposed deadlines of deliverables and milestones for the Product to be delivered to the customer.

### 5.1.1 Requirements Document - Internal Review

Linked Fist, LLC will be responsible for independently researching and documenting each section of the requirements outline for the ChocoAn Simulator, before meeting for an internal review to discuss and break through any roadblocks. Team assets may be reassigned at this time in order to facilitate timely competition, at the discretion of the Project Team.

### 5.1.2 Requirements Document - Pre-Approval Review

An initial first draft of this Requirements Document will be presented to the Chocoholics Anonymous Customer Representative, Christopher Gilmore on October 17th, 2022. The document presenter will record notes, feedback, and concerns of the Customer Representative, and work with the team to amend any issues or concerns brought up by the Customer Representative.

### 5.1.2 Requirements Document - Finalize

The final draft of the Requirements Document will be submitted to the Customer Representative for Chocoholics Anonymous, Christopher Gilmore, on October 21st, 2022. This will serve as the primary agreement and understanding of the product, ChocoAn Simulator, that Linked Fist, LLC will be responsible for providing to Chocoholics Anonymous.

## 5.2 Design Document

This section will outline the timeline of deliverables for the Design Document for the ChocoAn Simulator. Meeting this deliverable will require several meetings of the engineering team in order to strategize and outline the framework and architecture the ChocoAn Simulator will require in order to meet the customer, Chocoholics Anonymous’s needs and requirements.

### 5.2.1 Design Document - High Level Overview

In the week leading up to this milestone, the Linked Fist, LLC team will meet and discuss the high level outline for the project schema. This includes the Design Considerations, System Overview, System Architecture, and a high level draft of the System Design.

### 5.2.2 Design Document - Detailed Architecture Breakdown

Over the course of the next week, the team will coordinate and document more detailed breakdowns of the schema, components, and subcomponents required for the ChocoAn Simulator, culminating in a finalized System Design section of the Design Document. A review meeting will be held on this date in order to agree on the final design.

### 5.2.3 Design Document - Finalize

Team feedback will be taken and incorporated into the clean up and organization of Design Document for submission to Customer Representative, Christopher Gilmore on October 31th, 2022

## 5.3 Test Plan

The Test Plan will begin development in conjunction with the design document. The test plan will serve to guide testers and developers in ensuring that the ChocoAn Simulator performs to Client and Developer expectations.

### 5.3.1 Test Plan - System Testing

Initial draft of system testing will be pulled from the Use Cases outlined in the finalized Requirements document, they will be designed to validate that functionality meets the use cases presented by the customer Chocoholics Anonymous. This system test will be updated and finalized as the Design Document is finalized.

### 5.3.2 Test Plan - Smoke Testing

As the Architectural and Schema design decisions are formulated for the Design document, the initial drafts of smoke testing will begin. Smoke testing design planning will be updated as both the design document is completed, and as early code is being developed. Additionally, any defects encountered and fixed during system and unit testing may be added to the smoke test plan, up to project completion.

### 5.3.3 Test Plan - Unit Testing

Unit Testing planning will begin being authored in conjunction with the Detailed Architecture design. As functions and components of the ChocoAn Simulator are designed, Unit Tests will be planned in order to validate each component.

### 5.3.4 Test Plan - Finalize

The finalized Test Plan will be submitted to the Customer Representative Christopher Gilmore on November 17th, 2022.

## 5.4 Code and Unit Tests

Code Development and Unit Testing will begin near the completion of the Design Phase. Code and testing will be designed in order to meet the requirements specified by the client.

### 5.4.1 Test Database Creation

An initial test database will be created by hand during the Test Planning process in order to facilitate early code development.

### 5.4.2 Insert Into Database

The ability to insert data into the database correctly will be targeted as an early milestone.

### 5.4.3 Pull From Database

The ability to pull individual data points will be targeted shortly after database insertion.

### 5.4.4 Test Terminal

A test terminal will be developed in order to facilitate testing and demonstrations.

### 5.4.5 Testing

Testing will be performed throughout this phase to validate functionality and appearance.

### 5.4.6 Final Demonstration and Turn-in of Product

Final turn in of the project will be completed on December 2nd, 2022. Product Demonstrations will take place the following week.

## 5.5 Project Report

This project report will serve as a post-mortem analysis of the project. Identifying the strengths and weaknesses of the design process and tempo. It will be turned into the Christopher Gilmore on December 2nd, 2022.