

Group #4

Christopher Juncker

Justin Greever

Samantha Zeigler

Tori Anderson

Naya Mairena

Ian Guy

Dan Jang

The ChocAn Simulator

Requirements Document

Table of Contents

1	Introduction	3
1.1	<i>Purpose and Scope</i>	3
1.2	<i>Target Audience</i>	3
1.3	<i>Terms and Definitions</i>	4
2	Product Overview	7
2.1	<i>Users and Stakeholders</i>	7
2.1.1	ChocAn Care Providers	7
2.1.2	ChocAn IT Specialists	8
2.1.3	ChocAn Ethics & Security Specialist	8
2.1.4	ChocAn Patients	9
2.1.5	ChocAn Patients' Relatives	9
2.2	<i>Use cases</i>	9
2.2.1	Patient Billing	10
2.2.2	Patient Account Management	10
2.2.3	Product Directory	10
3	Functional Requirements	12

3.1	<i>Card Swipe Identifier</i>	12
3.1.1	Member Account Status Display	12
3.1.2	Entering a Service Provided	13
3.1.2	Display Next Fee to be Paid	14
3.2	<i>Provider Directory of Service Codes</i>	14
3.2.1	Enter a Service Code	14
3.2.2	Search Provider Directory	15
3.3	<i>Data Management (Add/Update/Delete)</i>	15
3.3.1	Member Data Management	15
3.3.2	Provider Data Management	16
4	Nonfunctional Requirements	17
4.1	<i>Scheduled Reports</i>	17
4.1.1	Member Summary Report	17
4.1.2	Provider Summary Report	18
4.1.3	Accounts Payable/Manager Summary Report	18
4.2	<i>Acme Third Party Integration</i>	18
4.2.1	Member Fee Status Updates	19
4.2.2	EFT File	19
4.3	<i>User Friendliness & Accessibility</i>	20
4.3.1	Audio Descriptions or Effects	20
4.3.2	Informational Supplementation	20
5	Milestones and Deliverables	21
5.1	<i>Project Requirements Documentation</i>	22
5.2	<i>Functional User-Interface</i>	22
5.2.1	Simulate Provider Keyboard and Display	23
5.2.2	Simulate Manager Keyboard and Display	23
5.3	<i>Organization of Data Files and Reports</i>	24
5.3.1	Manipulating the Data	24
5.3.2	Generation of Reports	24

Introduction

This document describes the Chocoholics Anonymous data processing software whose contract has been awarded to Group 4. This data processing software will be used by ChocAn to manage their members' and providers' data in a number of specific ways. A full description of the software will be accomplished in three steps. First, a product overview will be provided which will describe the product functionality and give multiple use cases. Second, all requirements, both functional and non-functional, will be listed and described. And third, the milestones and deliverables which can be expected as a part of the development process will be outlined as a series of stages.

Purpose and Scope

The purpose of this document is to codify the requirements for the ChocAn data processing software and to establish the route by which the required functionality will be delivered. This document will provide a plan for meeting all high-level client requirements as listed in Group 4's contract. Note that discussions involving specific programming languages or database solutions are outside of the scope of this document.

Target Audience

The intended audience for this document is Chocoholics Anonymous management, Group 4 software engineers, and CS300 instructors. The top tier management at Chocoholics Anonymous will be reviewing the document. They can give input on what they know they will need in the software. While some terms may not be known by them, the terms are defined and technical language is used throughout the

document. Team members of Group 4 will be reviewing the document throughout the development process. Looking back at what has changed and how to improve the product.

Terms and Definitions

Refer to the table below for clarification regarding the definition of any technical terms or acronyms used in this document.

Software Product (Software)	The Chocoholics Anonymous data processing software which is currently under development.
Group 4	The organization which has been awarded the contract to develop the Software Product (us).
Chocoholics Anonymous (ChocAn)	An organization dedicated to helping people addicted to chocolate in all its glorious forms.
ChocAn Data Center (CDC)	The data center which contains member and provider information.
Member	A person who pays a monthly fee to ChocAn and is entitled to unlimited consultations and treatments with providers.
Provider	A health care professional who provides services to members.
Provider Number	A nine-digit number which uniquely identifies a provider.
Member Number	A nine-digit number which uniquely identifies a member.
Member Card	A plastic card given to members containing their name member number.
Terminal	A computer terminal operated by a provider which scans member cards and which serves as an interface to communicate with the Software Product.
Manager Terminal	A terminal with elevated privileges that can request individual

	reports at any time.
Provider Directory	An alphabetically ordered list of all service names, and their corresponding codes and fees.
Member Directory	A list of all ChocAn members, both active and suspended.
Validated Member	A member whose number has been verified by the CDC.
Suspended Member	A member whose number has been marked as suspended by the CDC. Usually due to not paying on time, can be rectified by contacting a Care Administrator.
Service / Session	A health care service that is provided to a member. These services / sessions are offered by a provider.
Service Code	A six-digit number uniquely identifying a service offered by a provider.
Fee	The amount that ChocAn pays a provider for a service.
Membership Fee	The monthly amount that a member pays to ChocAn.
Main Accounting Procedure (MAP)	A weekly procedure which reads in all services provided during the week, and creates reports.
Member Report	A weekly report provided to each member who has consulted with ChocAn that week.
Provider Report	A weekly report sent to each provider containing a list of the services they provided that week and a summary.
Electronic Funds Transfer (EFT) Report	A record of electronic funds transfer data which is written to disk for use by banking computers later.
Summary Report	A weekly report provided to the manager of accounts payable listing all providers that need to be paid.
Interactive Mode	A software mode which allows members to be added, deleted, and updated in the CDC.
Milestone	A point in the software production schedule where we can assess the project progress.
Deliverable	A point in the software production that can be delivered to the customer before the final product.

Gantt Chart	A bar chart that visualizes a project's schedule. Each task is a milestone or deliverable. Each bar is the duration of the task with the due dates.
--------------------	---

Product Overview

The purpose of this software is to help Chocoholics Anonymous (ChocAn) provide better healthcare to their chocolate-addicted members. The software will manage members and providers, keep track of all services provided, and generate detailed informational reports and billing records. The sections below will list the users and stakeholders and provide an overview of how they will interact with or be affected by the product.

Users and Stakeholders

This section goes in detail about who the stakeholders and users are in the project. Stakeholders being anyone that the software is affected by the system. Users being anyone using the software whether they be a patient or provider. The section also includes use cases for the software that will show the process of the user operating the system.

ChocAn Care Providers

The care providers section will be split into two parts: administrative and specialists.

1. Care Administrators: are those who will be actively involved in checking the validity of the membership ID provided by the member attempting to access the services of ChocAn. This will be done through the use of Interactive Mode. Beyond this, no input is required for development or deployment. When it comes to maintenance, if something is to go wrong with membership (such as a suspended ID), the administrators should be the first to notice. In the event a member requests something like a cancellation, this should be referred to the IT Specialist.
2. Care Specialists: are those who provide the care to the member after they pass the checks by the administrators. Unlike the administrators however, the specialists are only concerned with usage of the software and not maintenance. This usage should be to record member data and to report services rendered.

ChocAn IT Specialists

The ChocAn IT specialists are individuals who will manage membership requests from the Care Administrators, as well as monitor the current status of the deployment of the software. The IT specialists also need to be able to have enough access to modify accounts in the case of an issue with membership arising in some form. This access should be tampered to the liking of the ethics and security specialists, with further outside access (for potential developmental purposes) needing their approval. This access should be provided through a Manager Terminal.

ChocAn Ethics & Security Specialist

The ChocAn ethics & security specialist is someone who monitors the database for any potential weaknesses, and suggests ways to further develop the software in an attempt to protect member anonymity. Because of this, the ethics & security specialist will participate in development, deployment, use, and maintenance of the software to do the required validation.

ChocAn Patients

The ChocAn patients are the users that have their info stored in the system. They rely on the system to be secure and have their data protected from malicious users. While they do not participate in the system actively, they are an important stakeholder for the system because they are the reason for the organization's creation. We have the safety of their data in mind when in the development process. This part of the development process is overseen by the ethics & security specialist as well since the patients are members of the organization.

ChocAn Patients' Relatives

Much like the patients of ChocAn, the relative's of the patients are also stakeholders of the system. They rely on us to be able to provide care for their families and loved ones. A well-maintained design and management system for care is important to provide proper treatment for the patients. Relatives of patients are also involved with billing and payment services at times, thus having the option to have multiple payment options are needed. Again, having any information be protected and secure in the system.

To have a relative of a patient gain access to the information of said patient, a request will be put in with the Care Administrators, who will then consult the Ethics & Security Specialist.

Use cases

This section will outline the possible uses of the software. We will outline three scenarios that our software is able to handle as well as the process for each use case. The system consists of a card reader, a terminal, and a manager terminal (for requesting confidential information / dealing with outside access to a patient such as by a relative).

Patient Billing

The software allows a member of ChocAn to swipe a card via the card reader on the terminal from the patient, verify that the patient is a member by contacting the ChocAn Data Center, and after services are provided, swipe the card again via the card reader on the terminal to add any billing codes to the patients account. The software contacts a remote system once the card is swiped, thus removing the need for on-site data storage.

Patient Account Management

When a member of ChocAn creates a new account for a patient, they are able to swipe a card via the card reader on the terminal and encode it with the patient's member number that was created from the ChocAn Data Center database. At any time, the patient

can have their card swiped via a card reader attached to a terminal at any ChocAn location, and it will allow services to be rendered to them. The software manages the scheduling of visits, patient personal information, patient notes, and any date service was provided as well as the list of services provided to the patient.

Product Directory

The software allows ChocAn providers to request a listing of all services provided via a Manager Terminal connected to the ChocAn Data Center; names, billing codes, and any fees. The system will generate the report in alphabetical order and send it as an email attachment to the provider who made the request. The directory can be edited to add new services, codes, fees, as well as remove invalid entries.

Functional Requirements

Functional requirements describe what services are to be provided by the system and how it behaves in different cases. This section describes the functional requirements for the software and the several cases that the system will encounter. It will also include how the system shouldn't react to special cases.

Card Swipe Identifier

In order for members to receive health care services and in order to bill ChocAn for those health care services provided, this system is able to accept an electronically coded magnetic strip from a member card to search the system and record the required information, permitting some extra information entered by the provider in specific cases.

Member Account Status Display

In order for a member to first receive any health care services, the member must first provide their member number by swiping their member card. The system will read this member number and compare it against the system's data to verify the member number is in fact a valid member number. If the system is able to find a matching member number and the member's account is not in suspended status, i.e. they do not have any outstanding fees on their account waiting to be paid off, then the system will display the word 'VALIDATED'. This means the member is able to receive a health care service at that time. If the number is not valid, then the system will display one of two reasons: 'INVALID NUMBER' or 'MEMBER SUSPENDED'. If the system is unable to find a matching member account for the provided number, then the first message will display. If the system was able to find a matching member account but the account has an outstanding fee balance that is yet to be paid, then the second message will display. This means the account is in 'suspended' status and the member is therefore unable to receive any health care services until the outstanding fee is paid. Once paid, the system will remove the 'suspended' status from that member's account and they will be able to receive health care services from providers.

Entering a Service Provided

After a health care service is provided to a member, the system must record the billing. After the word 'VALIDATED' appears on the screen, the provider will enter the date the service is provided as MM/DD/YYYY, which ensures that as long as the data is entered successfully, the provider can bill with the proper day in lieu of any other technical difficulties. The provider then uses the provider directory to find the

corresponding service code to the health care service provided to the member on the specified day and then enters this into the health care service member entry. Once this code is entered, the system displays corresponding service name next to the code entered so that the provider can verify they entered the correct service. If the code entered does not correspond to any existing service, then the system will print an error message. The provider will be unable to save the entry until a viable service code is entered. The provider is also able to enter notes about the service provided in this entry. The system will write all of this information to disk, including the current date and time, the date the service was provided, the provider number, the member number, the service code, and any comments entered. The provider number is pulled from the terminal that the provider uses when they are first asked to enter their provider number when they switch it on.

Display Next Fee to be Paid

After a service is entered, the system displays the fee amount to be paid to the provider for the service. The provider is responsible for writing down this amount for verification at the end of the week. The system will record this amount on the provider's account, along with the service information so that the provider's report can be ran at the end of the week and so the accounts payable report can total up the fees for the manager.

Provider Directory of Service Codes

In order for providers to be able to enter and search existing service codes into health care service entries, each provider is able to navigate a provider directory. This provider directory stores all available service codes that are composed of six digits and their corresponding name of up to twenty characters. This directory does not allow duplicate service code numbers. The provider is able to search this directory when

entering a service code into a member's health care service entry. Any provider can also request the entire list of service codes from the provider directory listed alphabetically by name, including the name of service, the corresponding service code, and the corresponding fee for the service.

Enter a Service Code

A provider can enter a service code into the provider directory at any time. The system will prompt for the service code first and will verify that the code provided is not currently in use. If the service code is currently used by another service, then the system will display an error that the code is already in use. If the code is not assigned to another service, the system will then prompt for the service name and the service fee associated with it. Once all of the required information is entered for the service code, the system will add the new service code into the provider directory to be used in future entries.

Search Provider Directory

A provider can search the provider directory for a service code by service code or by service name. The provider can search this directory at any time and when entering a member's health care service entry. This search will return the service name, corresponding code, and the service's associated fee. If the directory does not have a corresponding service code, then the system will display an error message.

Data Management (Add/Delete/Update)

This system is capable of storing, handling, and manipulating both member and provider data for the purposes of storing, displaying, and managing member services, provider services, and various financial processes and reporting. This system stores a variety of information corresponding to member account information and provider account information. This system is also capable of adding, deleting, and updating these accounts with information within this system.

Member Data Management

This system is able to enter members into the database so that they can receive health care services. To add a member, the system records the member's name, member's address information, including street address, city, state, and zip code. The system then generates a member number that has not been used by another member account and assigns this to the member account to be encoded on the member's card. This system can also delete members from the system either by name or by member code. The system will first search the data to see if there is a matching member number, if one is not found the system will display an error. If a matching member is found, the system will confirm the deletion of the member and remove all data associated with the member. If the member has not paid their fees, then the system will update that member's account to the status of 'SUSPENDED', which will prevent the member from receiving any healthcare services until the fee has been paid and the status has been removed. To update a member information, the system will search member by number and allow any changes to be made to all of the member's information except the member number, as this is the main data identifier and is encoded onto the card for the member. The member's fee status is automatically updated at 9pm when Acme updates the membership records with the information each evening for who has and who has not paid their membership fees.

Provider Data Management

The system is also able to enter new providers. It will take in the provider's name and provider's address information, including the street address, city, state, and zip code. The system then generates the provider's number, making sure a new number is generated that isn't in use from another provider and assigns it to the provider's account. The system can also search, display, update, and delete providers by provider number. The system will search the data by provider number and give the option to update any of the provider information or will delete the provider information, and remove any information associated with the provider number.

Nonfunctional Requirements

Nonfunctional requirements define the general characteristics, limitations, and passive functionality of the system. It also includes any maintenance or non-user initiated functions that the system may perform as a basis of running the program and manipulating the data it handles. This system has a variety of nonfunctional requirements, most of which pertain to the maintenance of the data, either adding, editing, or deleting members, and the generating of various reports to provide to various third parties.

Scheduled Reports

This system has the ability to provide numerous reports which are run at midnight on Friday by running the main accounting procedure. The system reads through all of the week's services provided and creates three types of reports and writes them to their respective files. Each of these reports can also be run on demand by the manager at any time and will pull all of the data from that week up to the time the report is run.

Member Summary Report

The first type of report that this system generates is the Member Summary. This report is generated weekly and is written to the member's file with the file name as the name of the member followed by the date the report was generated. At the top of this report, it lists the member's name, member's number, and the member's address information. It then goes on to list each service provided to the member including the date the service was provided, the provider's name, and the service's name.

Provider Summary Report

The next type of report that this system generates includes a Provider Summary. This report is generated weekly and is written to the provider's file with the file name of the name of the provider followed by the date of the report. At the top of the report, it lists the provider information including the provider name, provider number, provider's address information. This report then lists each service that they provided to a member for that week including the date of service, date and time data was entered, the member's name and member number, the service code, and the fee to be paid. At the bottom of the report, it summarizes the total number of consultations and the total fee for that week.

Accounts Payable/Manager Summary Report

The last type of report that the system provides is the Accounts Payable Report, which outlines the financial totals for the week. This report lists every provider that is to be paid for the week, including how many total consultations each provider had and the total fee for the week. At the bottom of this report, it totals the number of providers who provided services, the total number of all combined consultations, and the summed total of all fees that are to be printed. The report is written to the managers file with the file name as the manager's name followed by the date the report was generated. This information is then used to write the EFT file which will be sent to a third party to ensure the proper provider account is credited. (This is described later on.)

Acme Third Party Integration

Acme Accounting Services is a third party that will be providing accounting information and handling the majority of the accounting actions for the various billing requirements. This system takes the information provided from Acme and uses it to update member statuses depending on if the member has paid their fees or not.

Member Fee Status Updates

Every evening at 9pm, Acme provides any membership fee updates that allows the system to either suspend or reactivate member accounts who have either not paid or have paid their fees, respectively. Acme provides the system with any information regarding member accounts and updates the system at 9pm each night. If a member has failed to pay their fees, the system will update their account with the status of ‘SUSPENDED’, and that member will not be able to use any health care services until the fee is paid and the system updates for the following day. If a member has paid their outstanding fees, then the system will update their account and clear the ‘SUSPENDED’ status for the following day and the member will then be able to receive health care services.

EFT file

The EFT file will consist of the list of all provider’s who billed ChocAn for the week, where each list item includes the provider’s name, the provider’s number, and the amount to be transferred to the given provider. This EFT file is written and provided to Acme to ensure they have the required information to perform the necessary financial actions.

User-friendliness & Accessibility

By utilizing multiple methodologies to implement the user experience & accessibility compatibility, we will utilize various software features, such as audio descriptions, sound effects, coloring schema, and other features to fully heighten the user experience of the ChocAn software healthcare suite.

Audio Descriptions or Effects

For important aspects of the program, there will be (or multiple) audio descriptions, sound effects, narrations, et cetera., to ensure the user will be able to be fully immersed in the ChocAn healthcare experience, as well as to provide better accessibility and user-satisfaction.

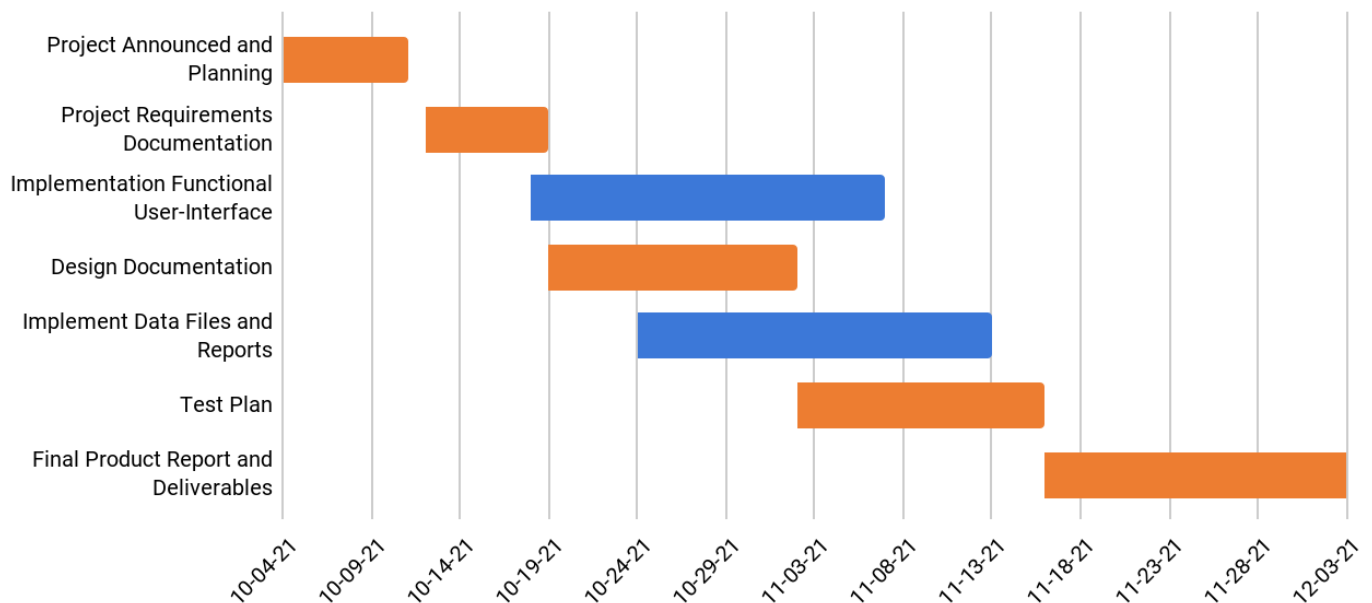
Informational Supplementation

Using different terminology and explanations thereof, we are able to provide the user with various ways to digest informational content. Using big words & scary terminology may degrade the user experience without subsequent further explanation, thus, verbiage & niche concepts will, whenever possible, be possibly supplemented with explanations or tooltips to enhance the user experience.

Milestones and Deliverables

The purpose of this section is to detail each milestone and deliverable for the project. A Gantt chart will be utilized to pinpoint each milestone/deliverable. A milestone is points in the project schedule where the progress of the product can be assessed. An example of a milestone is handing over the product system for testing. A deliverable is a product point to where we can deliver to the customer. An example of this is delivering the requirements documentation for the product to the customer. A Gantt chart is a graphical representation of a project schedule using a bar chart that is calendar based. It shows the responsibilities of each person working on the product, the expected time of completion, and when the activity begins and ends.

Gantt Chart:



Project Requirements Documentation

This project documentation will be the first milestone to be completed. The purpose of this milestone is to allow Group #4 members to organize the project requirements to prepare for software development. It is important to utilize this document so that all team members understand the expectations of the stakeholders. When completed, the project requirement document will be delivered to the ChocAn management, organizations that will be implementing the other softwares, Group #4 members, and CS300 instructor. The purpose of delivering this documentation is to update the customers with the plans for creating the data processing software. It will also help finalize the structure and expectations given by the customers so that everyone involved is on the same page. Each team member from Group #4 will share their ideas and understanding for the project requirements in this document. Once completed, this project requirements document will be delivered to the customers.

Functional User-Interface

This milestone is to prototype a functional user-interface without database functionality. The product starts with the interaction between the member and provider, this means that the interface for data processing must be properly implemented. Demonstration of inputting membership information against static debug array of 'valid' membership information, output invalid information errors wherever designed as such, and display membership information in an organized and readable manner. It is important to develop and test a user-friendly interface first because the rest of the project's implementation will come together with the knowledge on how the data processing software manipulates the input. Once the user-friendly interface is functional, the next

steps are to incorporate the process of reading data from files and writing data to files, generating reports from the data, and differentiating the users (providers, members, ChocAn operators and managers).

Simulate Provider Keyboard and Display

In this stage, the product will be developed so that the data processing software will handle all the information entered by the provider. The data processing software will know that the current data is from the provider based on the provider number that is entered. The software must manipulate the current data properly by checking for valid input, organizing the data to create the provider report from the form, and showcase the data to get an understanding of what the provider will receive from the terminal display. The deliverable that will be produced at the end of this stage is a finalized data processing software to cater to the provider and their needs.

Simulate Manager Keyboard and Display

In this second stage, the product must be developed to cater to the management of ChocAn. This means that data that is input by management and data to be displayed for management must be simulated. The software must be aware of the user, this being the manager, and only allow specific data to be manipulated and displayed. The deliverable that will be produced at the end of this stage will allow for a finalized operation of the data processing software for the managers of ChocAn.

Organization of Data Files and Reports

This milestone will deliver proper functionality of organizing the data into files and generating reports with extracting the proper data from the files. It will be important to implement writing to and reading from files properly by checking for conditionals and errors. To generate reports, it is important to know who the report is for, the purpose of the report, and what specific data must be extracted to be added to the report. The report must be displayed in an organized manner with the correct information requested by the user.

Manipulating the Data

The data is the most important piece of this software. The data must be checked every time that the user inputs new data with the conditional bounds set on that specific piece of data. The data must be kept secure and avoid unintentional manipulation when sending it to a file or extracting it from a file. When gathering information for a report, the data must be accessed with the proper conditions for the specific report and add new data as necessary. The deliverable that will be produced at the end of this stage is a data processing software that understands the gathering of data, organization of data, manipulation of data, security of data, and proper display of data.

Generation of Reports

At this stage, the necessary data has been collected and properly organized into its respective files. When a user wants to access a report, the data processing software must generate a report with the correct data requested. When generating reports, the software must first check the type of user accessing the data and the data they are requesting. After the program understands what type of report must be generated, then it will access the proper files for the necessary data. Once all the data has been collected to create the report, the software must organize the data to resemble a proper report. The last step is for the software to display the report to the user with all the data requested for that specific report. The deliverable that will be produced at the end of this stage is a data processing software that can generate reports for users utilizing the data that has been previously collected.