Software Requirements Specification

for

PatientNow

Version 1.0 approved

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Antebellum

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

This SRS describes the software functional and nonfunctional requirements for release 1.0 of the PatientNow System. This document is intended to be used by the members of the project team that will implement and verify the correct functioning of the system.

The development team conducted client interviews and independent research to gather the information compiled in this document. The purpose of our software requirements specification is to form the basis to guide further planning and implementation of the project. The paper is the first revision of the document.

1.2 Document Conventions

The team has organized the document into five major sections, plus the appendices. Each section may itself be comprised of smaller subsections. The main headings and three appendices appear in boldface 18-point font. Subheadings appear in boldface 14-point font. Subsequent sections (minor subheadings) appear in boldface 12-point font. Hierarchical numbering is used to label all requirements. Examples of the different heading font styles follow:

1. Main Heading

1.1 Subheading

1.1.1 Minor subheading

Section 4 (System Features) utilizes use cases to describe the system's major services. Each use case contains a description of the interactive steps an external actor performs along with the system to achieve a major task. Section 4 provides a more detailed outline of the use case format.

1.3 Intended Audience and Reading Suggestions

Antebellum has prepared this document for use by the medical office service firm and by developers who are implementing or will be modifying the system.

The client and developers of this system should read this entire document thoroughly. However, if a quick overview is needed, please refer to **Section 2: Overall Description**. This section provides a broad high-level overview of the Web Advising system.

For members of the medical office service firm, **Section 4: System Features** would be the primary focus of their reading. This section covers the different tasks that will be possible on the system, as well as how the doctors, administrative assistants, and patients will be able to interact with the system.

This document is the primary guideline for the requirements of the proposed system. Every thorough reading of this document helps create a better product. Any issues, concerns, or errors can be brought to the attention of Antebellum.

1.4 Product Scope

Please refer to the Vision and Scope document; section Scope and Limitations.

1.5 References

The references listed below were used to help create this document.

- Antebellum, 2016. *Vision and Scope Document*
- https://polylearn.calpoly.edu/AY_2016-2017/pluginfile.php/278050/mod_assign/introattachment/0/SRS%20example.pdf?forcedownload=1

2. Overall Description

2.1 Product Perspective

Medical offices currently have a disjointed solutions to a couple of problems including scheduling and sharing care plans with their patients. Patients are forced to keep track of their care plans themselves. This forces patients to be unable to review their medical records unless they request a copy. The main goal of this is to provide one unified piece of software for both scheduling appointments and viewing past medical records and care plans.

As we understand, the current solution is problematic due to it segregated, individual systems of scheduling and care plan management. In addition the current solution lacks efficient ways of communicating medical records and recommendations with the patient out of the office.

The proposed application would replace the existing system for scheduling while extending the existing medical record system to allow sharing of selected files. This would allow practices to increase their patient satisfaction and therefore increase adoption of this software.

2.2 Product Functions

This section provides an outline of the functionality needed to meet the needs of all the anticipated user classes as defined in section 2.3.

The major features of the Patient Care Plan and Scheduling software will include:

- Medical Professionals and administrative staff will be able to schedule appointments, this includes rooms and medical professionals needed
- Patients will be able to schedule basic appointments during hours dedicated to those general appointments.

- Medical Professionals will be able to view and edit patient care plans including sharing select medical records with the patient in a secure fashion.
- Medical Professionals and administrative staff can add patients to the system.
- Patients will be able to see up to date care plans and scheduled appointments without leaving our application
- Patients will be able to see their bill and access the payment system from our application, however we will not process payments

For a high-level picture of the groups required for theses major requirements, refer to the following diagrams in Appendix B:

- DFD Level 0
- DFD Level 1

2.3 User Classes and Characteristics

During the design of this system we identified the following user classes, they are described in depth below:

- Patients
- Administrative Assistants
- Medical Professionals

2.3.1 Patient

This system is designed to allow patients access to their care plan and schedule. Patients will generally use this as a convenient collection of information and a way of scheduling basic appointments. The system will also generally help patients keep track of their medical professionals current recommendations for care and records that the doctor has shared with the patient

2.3.2 Administrative Assistant

Like for the Patients this system is designed to consolidate important information, and the entering of said information. This system will make it easier for Administrative assistants to edit schedules and bill patients. The Administrative assistants however will not be allowed to access any information shared between the patient and the Medical Professional. That information is not necessary for the Administrative Assistant to perform their job and is therefore protected by HIPPA.

2.3.3 Medical Professional

Medical Professionals will be able to perform all of the actions allowed to an administrative assistant for the event that in smaller practices they are required to perform those responsibilities. In addition the system will allow them to share information with the patient via the patient's care plan and associated medical records. The system will also allow the Medical professional to set their available hours.

2.4 Operating Environment

Our system will operate on the medical offices own servers and will be accessed by patients via a modern web browser such as Chrome or firefox. This website will only be accessible via SSL/TLS (Secure Sockets Layer/Transport Layer Security)to avoid medical records being transmitted over unsecure connections. This system will need a secure link to the existing medical record system to allow for sharing of medical records with patients. The care plans need to be stored in a new database separate from the existing medical record database.

2.5 Design and Implementation Constraints

The following constraints will define the system's implementation.

- Users must be using a browser that supports SSL to access the website due to security concerns
- The practice must have a constant outward facing IP and concurrent users are limited by the practices bandwidth

2.6 Assumptions and Dependencies

We are assuming the that each practice is able to host an external facing website. This includes the cost of a static IP and server upkeep. We are also assuming that the current Medical record system has existing credential protection and also an accessible interface.

3. External Interface Requirements

3.1 User Interfaces

<Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.>

3.2 Hardware Interfaces

<Describe the logical and physical characteristics of each interface between the software product and the hardware components of the system. This may include the supported device types, the nature of the data and control interactions between the software and the hardware, and communication protocols to be used.>

3.3 Software Interfaces

<Describe the connections between this product and other specific software components (name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify the data items or messages coming into the system and going out and describe the purpose of each. Describe the services needed and the nature of communications. Refer to documents that describe detailed application programming interface protocols. Identify data that will be shared across software components. If the data sharing mechanism must be implemented in a specific way (for example, use of a global data area in a multitasking operating system), specify this as an implementation constraint.>

3.4 Communications Interfaces

<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.>

4. System Features

At a high level, the system is limited to a small number of main features--these features can be used by three different groups of users. More specifically, features are available to users in a cascading style, so that the most 'powerful' user has access to all features of the system, while each level of sub-user is limited to a smaller subset of features. In order to illustrate this concept, we have constructed a chart, which follows this text. Each user group is privy to all features at or below its level in the chart:

USER	**FEATURE**
Medical Professional (Doctor, Dentist, etc.)	Upload medical documents/ care plan
Administrative Assistant	Schedule/cancel non-routine appointment Upload bill invoice Modify availability of rooms/medical professionals
Patient	Schedule/cancel routine appointment View schedule View bill View care plan/ medical documents

As shown above, medical professionals are capable of interacting with all features in the chart, while patients are limited to modifying routine appointments and viewing documents.

4.0.1 General User Interaction with Application

In order to access this application, all user groups will log into the website associated with their medical practice. As such, the application will be served up by a web browser, and all actions will be performed by interacting with the website GUI. Given that different users have varying levels of access, certain features will be hidden from certain users (for instance, patients will not be able to schedule non-routine appointments).

4.0.2 Format of System Features

For clarity, we have outlined high-level features as use cases below. These use cases describe how users interact with the system. Accompanying these use cases are sequence diagrams, which represent interactions with the system as function calls--sequence diagrams can be found in Appendix B.

We standardized our use cases with the following convention:
ID and Name
Modification Information
Description of Feature/Actor
Pre/Postconditions
Feature prominence
Steps that occur throughout feature (including all routes and exceptions)
Information that may affect which steps occur

4.1 Level 0 Use Cases (All users, including patients, have access to)

Use Case ID	UC - 1
Use Case Name	Patient Account Registration
Created By Last Updated By	David McIntyre
Date Created Date Last Updated	10/14/16
Actor	Patient
Description	Allows a patient to register for the practice's website
Preconditions	1. User is not logged in
Postconditions	1. User is a registered member of the practice's website

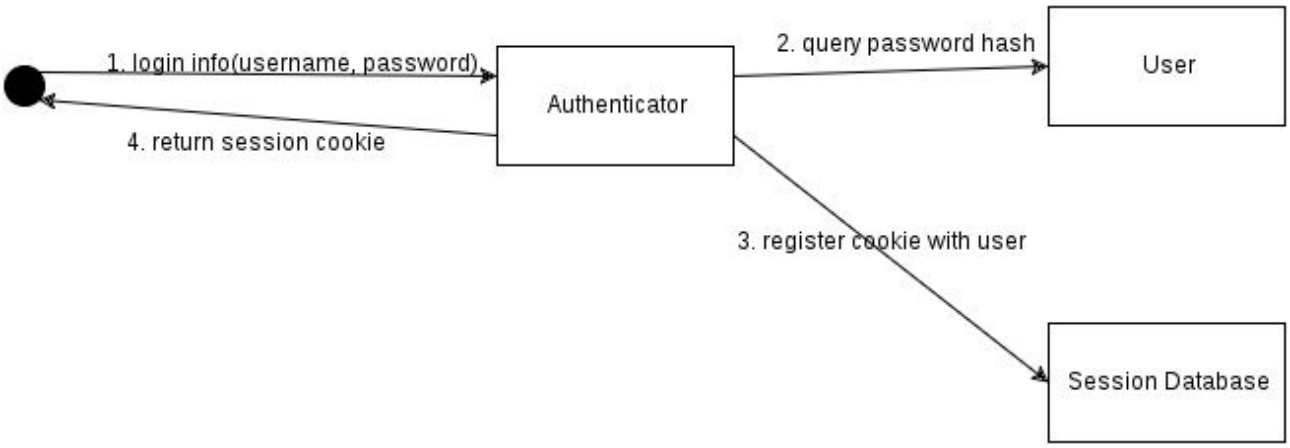
Priority	Medium
Frequency of Use	Low
Normal Course	**1.0 Basic Registration** **Actor Actions** 1. Patient clicks 'register as patient' 3. Patient enters personal information into the registration form and hits submit 6. User clicks link in confirmation email **System Responses** 2. System redirects user to the patient registration form 4. System checks form for appropriate data (repeat steps 3 & 4 until form is correctly filled) 5. System redirects user to a page asking them to confirm their email 6. System redirects user to registration confirmation page
Alternative Course	**None**
Exceptions	
Includes	
Special Requirements	
Assumptions	User is a registered patient of the office but not registered to the website
Notes and Issues	

Use Case ID	UC - #
Use Case Name	Logging in
Created By Last Updated	Jackson Darrow Jackson Darrow
Date Created Date Last Updated	October 14, 2016 October 14, 2016
Actor	Patient, Admin, Doctor

<table>
<tr><td>Description</td><td>Actor enters their username and password into the login page, the username is linked to a user object that was created during the “register account” step. The user then receives a cookie that will maintain the user's session. The login feature is only available if the user has an expired or terminated cookie.</td></tr>
<tr><td>Preconditions</td><td>User is connected to the website.
User has registered.
User has an expired or invalid session cookie.</td></tr>
<tr><td>Postconditions</td><td>User has an active session cookie that is tied to their user state.</td></tr>
<tr><td>Priority</td><td>Medium</td></tr>
<tr><td>Frequency of Use</td><td>High</td></tr>
<tr><td>Normal Course</td><td>#.0 Actor logs in
<table>
<tr><th><u>Actor Actions</u></th><th><u>System Responses</u></th></tr>
<tr><td>2. Student enters credentials.</td><td>1. System prompts the user for their credentials.

3. System checks the credentials against database.
4. System displays message: <Username>
is successfully logged in.
5. System gives the user's browser a session cookie.
6. Subsequent requests will be tied to their user object which has the proper permissions.</td></tr>
</table></td></tr>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>#.E.1 Username does not exist
<table>
<tr><th><u>Actor Actions</u></th><th><u>System Responses</u></th></tr>
<tr><td></td><td>1. Display message: <username> could not be found in database, please contact advising staff. 2. Start Normal Course over.</td></tr>
</table></td></tr>
</table>

	#.E.2 Password is not correct **Actor Actions** / **System Responses** 1. Display message: incorrect password 2. Start Normal Course over.
Includes	
Special Requirements	None
Assumptions	None
Notes and Issues	None



Use Case ID	UC - #
Use Case Name	Change Password
Created By Last Updated By	David McIntyre
Date Created Date Last Updated	10/16/16
Actor	Any

<table>
<tr><td>Description</td><td>Allows a registered member of the site to change their password</td></tr>
<tr><td>Preconditions</td><td>1. User is a registered member of the practice's website</td></tr>
<tr><td>Postconditions</td><td>2. User's password has been changed</td></tr>
<tr><td>Priority</td><td>Medium</td></tr>
<tr><td>Frequency of Use</td><td>Very Low</td></tr>
<tr><td>Normal Course</td><td>#.0 Change Password

<u>Actor Actions</u>
1. User is logged in and clicks 'view account details'
3. User clicks 'change password'
5. User enters their current password in both fields
8. User enters a new password in both fields

<u>System Responses</u>
2. System redirects user to account details page
4. System redirects user to confirm current password form
6. System checks user's current password (repeat 5 & 6 until it matches)
7. System redirects user to choose new password form
9. System checks if passwords match and if they meet all security criteria (repeat 8 & 9 until they do)
10. System redirects user to changed password confirmation page</td></tr>
<tr><td>Alternative Course</td><td>#.0 Forgotten Password

<u>Actor Actions</u>
1. User is not logged in and clicks 'forgotten password?' on the login page'
4. User clicks 'change password' in their email
6. User enters a new password in both fields

<u>System Responses</u>
2. System sends a link to change password to the user's email
3. System asks user to confirm their email
5. System redirects user to choose new password form
7. System checks if passwords match and if they meet all security criteria (repeat 6 & 7 until they do)
8. System redirects user to</td></tr>
</table>

	changed password confirmation page
Exceptions	
Includes	
Special Requirements	
Assumptions	User is
Notes and Issues	

Use Case ID	UC - #
Use Case Name	View List of Existing Appointments
Created By Last Updated	Seth Barrios Seth Barrios
Date Created Date Last Updated	October 14, 2016 October 14, 2016
Actor	Patient
Description	The user can view his/her appointments that he/she is scheduled to attend.
Preconditions	User is logged in.
Postconditions	Existing appointments are displayed on screen. Without interaction, user can see basic information about appointment
Priority	High
Frequency of Use	Very high. User is anticipated to view their upcoming appointments nearly every time he/she logs in.
Normal Course	<table><tr><td>Actor Actions</td><td>System Actions</td></tr></table>

<table>
<tr><td></td><td>
<table>
<tr><td>1. User navigates to schedule-viewing screen</td><td>2. System requests list of user's upcoming appointments
3. System retrieves list of user's upcoming appointments
4. System displays list of user's appointments and basic information associated with each appointment</td></tr>
</table>
</td></tr>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>#.E.1 System is unable to retrieve list of upcoming appointments
Actor Actions and System Responses
<table>
<tr><td>Actor Actions</td><td>System Actions</td></tr>
<tr><td>1. User navigates to schedule-viewing screen

5. User attempts to view schedule again if desired</td><td>2. System requests list of user's upcoming appointments
3. System is unable to retrieve list of user's upcoming appointments
4. System displays error message informing user that the system is temporarily unavailable</td></tr>
</table>
</td></tr>
<tr><td>Includes</td><td>None</td></tr>
<tr><td>Special Requirements</td><td>None</td></tr>
<tr><td>Assumptions</td><td>User has one or more future appointments.</td></tr>
<tr><td>Notes and Issues</td><td>None</td></tr>
</table>

Use Case ID	UC - #
Use Case Name	Scheduling routine appointment
Created By Last Updated	Seth Barrios Seth Barrios

<table>
<tr><td>Date Created
Date Last Updated</td><td>October 16, 2016
October 16, 2016</td></tr>
<tr><td>Actor</td><td>Patient</td></tr>
<tr><td>Description</td><td>The user can elect to schedule a general appointment with the medical practice.</td></tr>
<tr><td>Preconditions</td><td>The user is already logged in.</td></tr>
<tr><td>Postconditions</td><td>The patient and the medical practice are aware of the newly scheduled appointment.</td></tr>
<tr><td>Priority</td><td>High</td></tr>
<tr><td>Frequency of Use</td><td>Medium-high. While the user likely will not perform this action every time he/she logs in, this feature is essential to scheduling software.</td></tr>
<tr><td>Normal Course</td><td>
<table>
<tr><th>Actor Actions</th><th>System Actions</th></tr>
<tr><td>1. User navigates to the new-appointment-scheduling screen

4. User selects the type of appointment they wish to schedule

7. User selects 1+ medical professional they prefer to see

10. User finds desired appointment and elects to reserve it</td><td>2. System requests and retrieves list of general appointment types
3. System uses this list to display a prompt for selecting appointment type

5. System requests and retrieves list of medical professionals who can service selected type of appointment
6. System uses this list to display a prompt for selecting preferred medical professionals

8. System requests and retrieves list of available appointment times for appointment type and group of medical professionals
9. System displays list of available appointments and details about them
11. System attempts to reserve appointment for user
12. Appointment is officially reserved. User receives confirmation of the reservation</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td></td></tr>
<tr><td>Alternative Course</td><td>#.1 User does not like any times associated with selected medical professionals
Branch after #.6
<table><tr><td>Actor Actions</td><td>System Actions</td></tr><tr><td>1. User selects new group [1+] of preferred medical professionals

4. User finds desired appointment and elects to reserve it</td><td>2. System requests and retrieves list of available appointment times for appointment type and list of medical professionals
3. System displays list of available appointments and details about them
5. System attempts to reserve appointment for user
6. Appointment is officially reserved. User receives confirmation of the reservation</td></tr></table></td></tr>
<tr><td>Exceptions</td><td>#.E.1 System is unable to retrieve:
A) A list of available appointment types (branch after #.2)
B) A list of available medical professionals (branch after #.5)
C) A list of available appointment times (branch after #.8)

<table><tr><td>Actor Actions</td><td>System Actions</td></tr><tr><td>3. User can choose to retry action if possible/desired</td><td>1. System is unable to retrieve requested data
2. System displays option to retry action to user, or system displays error message</td></tr></table>
#.E.2 System is unable to reserve appointment
Branch after #.11

<table><tr><td>Actor Actions</td><td>System Actions</td></tr></table></td></tr>
</table>

	3. User can choose to retry action if possible/desired 1. System is unable to validate reservation of appointment 2. System displays error message and/or displays option to retry action
Includes	None
Special Requirements	None
Assumptions	Office has already specified what type of appointments are available, which medical staff can service those appointments, and when those medical staff are available.
Notes and Issues	None

Use Case ID	UC - #
Use Case Name	Canceling Scheduled Appointment
Created By Last Updated	Seth Barrios Seth Barrios
Date Created Date Last Updated	October 16, 2016 October 16, 2016
Actor	Patient
Description	The user can elect to cancel an appointment
Preconditions	The user is already logged in and viewing his/her schedule of appointments.
Postconditions	The patient and medical practice receive confirmation of the cancellation.
Priority	High
Frequency of Use	Medium.
Normal Course	Actor Actions / System Actions

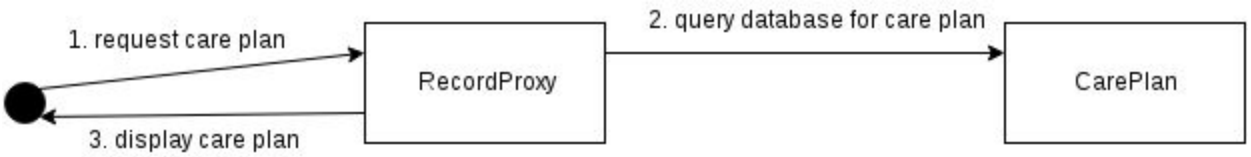
<table>
<tr><td></td><td>
<table>
<tr><td>1. User finds appointment they wish to cancel and elects to cancel it.

5. User acknowledges that cancellation was approved.</td><td>2. System requests cancellation
3. System approves cancellation and updates to reflect it
4. System replies and displays confirmation prompt to user</td></tr>
</table>
</td></tr>
<tr><td>Alternative Course</td><td>#.1 Cancellation is not allowed
Branch after #.2
<table>
<tr><td>Actor Actions</td><td>System Actions</td></tr>
<tr><td>3. User acknowledges denial message</td><td>1. System denies cancellation and responds with reason for denial
2. System displays denial message</td></tr>
</table>
</td></tr>
<tr><td>Exceptions</td><td>#.E.1 System is unable to confirm or deny cancellation
Branch after #.2
<table>
<tr><td>Actor Actions</td><td>System Actions</td></tr>
<tr><td>3. User acknowledges system inability and may elect to submit cancellation again</td><td>1. System does not respond or responds with error
2. System displays error message</td></tr>
</table>
</td></tr>
<tr><td>Includes</td><td>None</td></tr>
<tr><td>Special Requirements</td><td>Cancellation must conform to guidelines laid out by practice (time and other constraints)</td></tr>
</table>

Assumptions	Practice has determined guidelines that cancellations must conform to.
Notes and Issues	None

Use Case ID	UC - #
Use Case Name	View Care Plan
Created By Last Updated	Jackson Darrow Jackson Darrow
Date Created Date Last Updated	October 14, 2016 October 14, 2016
Actor	Patient, Admin, Doctor
Description	Patients are able to see a link to view their own care plan, and doctors and admins are able to see the care plans of all patients. When one of these users selects to see a care plan, the correct plan is displayed in their browser.
Preconditions	User is logged into the site
Postconditions	User has seen their care plan documents
Priority	High
Frequency of Use	Medium
Normal Course	#.0 Actor views care plan documents **Actor Actions** / **System Responses** 1. Users clicks on 'view care plan' for either themselves or another patient. 2. System checks against database to make sure that the user is permitted to view the plans. 3. System displays the care plan on the browser and makes it available for download. 4. System logs interaction

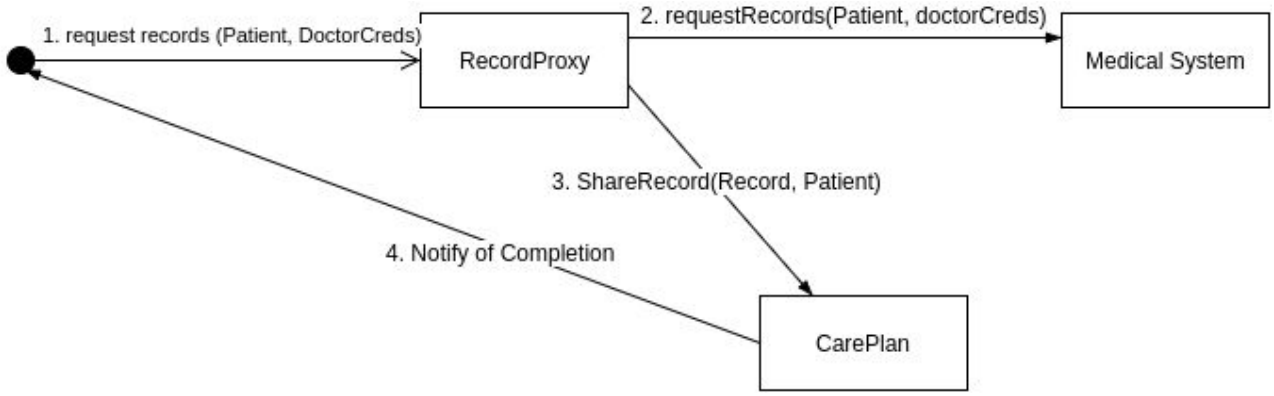
<table>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>#.E.1 User does not have permission
<table>
<tr><th><u>Actor Actions</u></th><th><u>System Responses</u></th></tr>
<tr><td></td><td>1. Display message: 403 Forbidden.
2. Start Normal Course over.</td></tr>
</table>
#.E.2 User does not have available careplans.
<table>
<tr><th><u>Actor Actions</u></th><th><u>System Responses</u></th></tr>
<tr><td></td><td>1. Display message: You do not have any care plans available at this time, please speak with your doctor to figure this out.
2. Start Normal Course over.</td></tr>
</table></td></tr>
<tr><td>Includes</td><td></td></tr>
<tr><td>Special Requirements</td><td>None</td></tr>
<tr><td>Assumptions</td><td>User has a care plan to view.</td></tr>
<tr><td>Notes and Issues</td><td>None</td></tr>
</table>



Use Case ID	UC - #
Use Case Name	View Bill
Created By Last Updated	Johnathan Nicholson

<table>
<tr><td>Date Created
Date Last Updated</td><td>October 14, 2016
October 15, 2016</td></tr>
<tr><td>Actor</td><td>Patient</td></tr>
<tr><td>Description</td><td>Allow the patient to see their current bill, including outstanding charges and current balance</td></tr>
<tr><td>Preconditions</td><td>Patient is Logged in</td></tr>
<tr><td>Postconditions</td><td>Patient has a view of their current bill and charges</td></tr>
<tr><td>Priority</td><td>Medium</td></tr>
<tr><td>Frequency of Use</td><td>Medium</td></tr>
<tr><td>Normal Course</td><td><table><tr><td>Actor Actions</td><td>System Actions</td></tr><tr><td>1. User requests bill
4. User sees bill</td><td>2. System asks payment system current status
3. Parses current information, returns outstanding charges and balance</td></tr></table></td></tr>
<tr><td>Alternative Course</td><td>#.1 User has no charges<table><tr><td>Actor Actions</td><td>System Actions</td></tr><tr><td>1. User requests bill
4. User sees clean requests</td><td>2. System asks payment system current status
3. Payment system returns empty charges</td></tr></table></td></tr>
<tr><td>Exceptions</td><td>#.E.2 User cannot be found in payment system<table><tr><td>Actor Actions</td><td>System Actions</td></tr><tr><td>1. User requests bill
4. User sees message instructing them to contact the medical office</td><td>2. System asks payment system current status
3. Payment system returns not found</td></tr></table></td></tr>
</table>

Includes	
Special Requirements	
Assumptions	All users should be registered with the payment system.
Notes and Issues	We have no control over the payment system. Therefore our system cannot resolve users not having accounts



4.2 Level-1 Use Cases (Administrative Assistant and Medical Professional)

Use Case ID	UC - #
Use Case Name	Schedule All Kinds of Appointments with Patients
Created By Last Updated	Christiana Ushana
Date Created Date Last Updated	October 14, 2016
Actor	Administrative Assistant
Description	Administrative Assistant will be able schedule general and more important appointments through the system.
Preconditions	Administrative Assistant is logged in and can view the schedule
Postconditions	Selected patients will be scheduled to the schedule with varying types of

<table>
<tr><td></td><td>appointments</td></tr>
<tr><td>Priority</td><td>High</td></tr>
<tr><td>Frequency of Use</td><td>Very high frequency, will be used everyday</td></tr>
<tr><td>Normal Course</td><td>(Use # of UC ID) #.0 description
<table>
<tr><td><u>Actor Actions</u>

2. Administrative Assistant will view the schedule after logging in and look for an available time to schedule an appointment.

3. They will request the system to add/edit/cancel appt or update information.

5. Fill in necessary information requested by the system.

6. Save to finalize schedule and information changes.</td><td><u>System Responses</u>
1. Schedule appears on screen with available sections open to schedule appointments in.

4. Pop up will prompt user to fill in necessary information for appointment. System will ask if user wants to add/ edit/cancel appt or update information.

7. System will check for conflicts, save data, and notify completion of scheduled appointment or changed data.</td></tr>
</table></td></tr>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>None</td></tr>
<tr><td>Includes</td><td></td></tr>
<tr><td>Special Requirements</td><td></td></tr>
<tr><td>Assumptions</td><td>None</td></tr>
<tr><td>Notes and Issues</td><td>None</td></tr>
</table>

<table>
<tr><td>Use Case ID</td><td>UC - #</td></tr>
<tr><td>Use Case Name</td><td>View Schedule</td></tr>
<tr><td>Created By
Last Updated</td><td>Christiana Ushana</td></tr>
<tr><td>Date Created
Date Last Updated</td><td>October 14, 2016</td></tr>
<tr><td>Actor</td><td>Administrative Assistant</td></tr>
<tr><td>Description</td><td>Administrative Assistant will be able to view all appointments on the schedule.</td></tr>
<tr><td>Preconditions</td><td>Administrative Assistant is logged in.</td></tr>
<tr><td>Postconditions</td><td>Administrative Assistant will be able to view the schedule.</td></tr>
<tr><td>Priority</td><td>High</td></tr>
<tr><td>Frequency of Use</td><td>Very high frequency</td></tr>
<tr><td>Normal Course</td><td>(Use # of UC ID) #.0 description
<table>
<tr><td><u>Actor Actions</u>
1. User is logged in.

3. User is now viewing the schedule.</td><td><u>System Responses</u>

2. After logging in, system will display the available schedule</td></tr>
</table>
</td></tr>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>None</td></tr>
<tr><td>Includes</td><td></td></tr>
<tr><td>Special Requirements</td><td></td></tr>
<tr><td>Assumptions</td><td>Administrative Assistant is registered on the system.</td></tr>
<tr><td>Notes and Issues</td><td>None</td></tr>
</table>

<table>
<tr><td>Use Case ID</td><td>UC - #</td></tr>
<tr><td>Use Case Name</td><td>Modify availability of medical professional</td></tr>
<tr><td>Created By
Last Updated</td><td>Paula Ledgerwood
(your name if updated)</td></tr>
<tr><td>Date Created
Date Last Updated</td><td>E.g. October 14, 2016</td></tr>
<tr><td>Actor</td><td>Medical professional, administrative assistant</td></tr>
<tr><td>Description</td><td>When the medical professional is sick or has a day off, they need to change their schedule and the availability needs to be changed.</td></tr>
<tr><td>Preconditions</td><td>Logged in, viewing schedule</td></tr>
<tr><td>Postconditions</td><td>Schedule of medical professional is changed,and list of notifications given out</td></tr>
<tr><td>Priority</td><td>Medium</td></tr>
<tr><td>Frequency of Use</td><td>Low, hopefully</td></tr>
<tr><td>Normal Cours</td><td>(Use # of UC ID) #.0 description
<table>
<tr><th><u>Actor Actions</u></th><th><u>System Responses</u></th></tr>
<tr><td>1. Click on individual work schedule</td><td></td></tr>
<tr><td></td><td>2. Individual’s work schedule appears</td></tr>
<tr><td>3. Click on specific event</td><td></td></tr>
<tr><td></td><td>4. Specific day/event’s information appears, with options to edit name, time start, time end, to delete</td></tr>
<tr><td>5. Edit specific day’s information</td><td></td></tr>
<tr><td>6. Click save.</td><td></td></tr>
<tr><td></td><td>7. After the person saves, the scheduled appointments that will be affected will appear so the medical professional can choose if they want to continue with their save.</td></tr>
<tr><td>8. They can choose to confirm that they they will be affecting the listed scheduled</td><td></td></tr>
</table></td></tr>
</table>

	appointments / **9. If they continue saving, the necessary information will be changed, and a list of affected parties will be generated. If not, the editing screen will appear again with no changes saved.** / **10. If no, they can edit the chosen event again and start the cycle from step 3 again.**
Alternative Course	**#.1 description** **None**
Exceptions	**#.E.1 insert description** **None**
Includes	Logging in, viewing schedule
Special Requirements	They need to be either a medical professional or an administrative assistant.
Assumptions	None
Notes and Issues	None

Use Case ID	UC - #
Use Case Name	Edit basic patient information
Created By Last Updated	Paula Ledgerwood
Date Created Date Last Updated	October 15, 2016
Actor	Medical Professional, Admin
Description	The user will be able to change basic information about a patient, like their name, address, billing information, phone number, and email.

<table>
<tr><td>Preconditions</td><td>1. Logged in, the patient exists</td></tr>
<tr><td>Postconditions</td><td>1. The patient's new information will be in the system, replacing the old information.</td></tr>
<tr><td>Priority</td><td>Medium</td></tr>
<tr><td>Frequency of Use</td><td>Medium</td></tr>
<tr><td>Normal Course</td><td>(Use # of UC ID) #.0 The user will edit the basic information of a patient
<table>
<tr><th><u>Actor Actions</u></th><th><u>System Responses</u></th></tr>
<tr><td></td><td>1. There might be some type of searchable system for the user to find the correct patient.</td></tr>
<tr><td>2. Find the patient in the system
3. Click Edit.</td><td></td></tr>
<tr><td></td><td>4. The patient's information will appear where the user can edit.</td></tr>
<tr><td>5. Change information, like their name, address, billing information, phone number, and email.
6. Click Save.</td><td></td></tr>
<tr><td></td><td>7. After they press save, the regular patient screen will appear.</td></tr>
</table></td></tr>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>None</td></tr>
<tr><td>Includes</td><td>(insert other Use Case ID)</td></tr>
<tr><td>Special Requirements</td><td>Medium Professional or Administrative Assistant</td></tr>
<tr><td>Assumptions</td><td>None</td></tr>
<tr><td>Notes and Issues</td><td>None</td></tr>
</table>

Use Case ID	UC - #

<table>
<tr><td>Use Case Name</td><td>Add new patient to patient database</td></tr>
<tr><td>Created By
Last Updated</td><td>Paula Ledgerwood</td></tr>
<tr><td>Date Created
Date Last Updated</td><td>October 15, 2016</td></tr>
<tr><td>Actor</td><td>Medical Professional, Administrative assistant</td></tr>
<tr><td>Description</td><td></td></tr>
<tr><td>Preconditions</td><td>Logged in, viewing current patient list</td></tr>
<tr><td>Postconditions</td><td>New patient will be added to patient list</td></tr>
<tr><td>Priority</td><td>High</td></tr>
<tr><td>Frequency of Use</td><td>Medium</td></tr>
<tr><td>Normal Course</td><td>(Use # of UC ID) #.0 description
<table>
<tr><th><u>Actor Actions</u></th><th><u>System Responses</u></th></tr>
<tr><td>1. Click button to Add New Patient</td><td></td></tr>
<tr><td></td><td>2. A form appears for the user to add information, requiring name, contact information, and address.</td></tr>
<tr><td>3. Enter necessary information</td><td>4. Option to save is at the bottom of the form.</td></tr>
<tr><td>5. Click save.</td><td>6. Information is saved in database.</td></tr>
</table></td></tr>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>None</td></tr>
<tr><td>Includes</td><td>(insert other Use Case ID)</td></tr>
<tr><td>Special Requirements</td><td>Have medical professional or administrative assistant access.</td></tr>
<tr><td>Assumptions</td><td>Required information is name, contact information, and address for a patient.</td></tr>
<tr><td>Notes and Issues</td><td></td></tr>
</table>

<table>
<tr><td>Use Case ID</td><td>UC - #</td></tr>
<tr><td>Use Case Name</td><td>Charge a patient for a service provided</td></tr>
<tr><td>Created By
Last Updated</td><td>Paula Ledgerwood</td></tr>
<tr><td>Date Created
Date Last Updated</td><td>October 15, 2016</td></tr>
<tr><td>Actor</td><td>Administrative assistant, Medical Professional</td></tr>
<tr><td>Description</td><td>After a service has been provided, the admin or medical professional will be able to charge the patient the appropriate cost.</td></tr>
<tr><td>Preconditions</td><td>Logged in, viewing patient in database</td></tr>
<tr><td>Postconditions</td><td>A post on the patient’s account regarding the amount due will be visible.</td></tr>
<tr><td>Priority</td><td>High</td></tr>
<tr><td>Frequency of Use</td><td>High</td></tr>
<tr><td>Normal Course</td><td>(Use # of UC ID) #.0 description
<table>
<tr><td><u>Actor Actions</u>
1. Click Charge patient

3. Enter amount due.
4. Press Charge</td><td><u>System Responses</u>

2. A form taking in an amount of money will appear

5. The charge will appear on the patient’s billing page.</td></tr>
</table></td></tr>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>None</td></tr>
<tr><td>Includes</td><td>(insert other Use Case ID)</td></tr>
<tr><td>Special Requirements</td><td>(short description)</td></tr>
<tr><td>Assumptions</td><td>(short description)</td></tr>
<tr><td>Notes and Issues</td><td></td></tr>
</table>

4.3 Level-2 Use Cases (Only Medical Professionals)

Use Case ID	UC - #
Use Case Name	Medical Professional Account Registration
Created By Last Updated By	David McIntyre
Date Created Date Last Updated	10/16/16
Actor	Medical Professional
Description	Allows an employee to register for the practice's website
Preconditions	2. User is not logged in
Postconditions	3. User is a registered member of the practice's website
Priority	Medium
Frequency of Use	Low
Normal Course	**#.0 Professional Registration** **Actor Actions** 1. User clicks 'register as professional' 3. User enters personal and professional information into the registration form and hits submit 6. User clicks link in confirmation email **System Responses** 2. System redirects user to the professional registration form 4. System checks form for appropriate data (repeat steps 3 & 4 until form is correctly filled) 5. System redirects user to a page asking them to confirm their email 6. System redirects user to registration confirmation page
Alternative Course	**None**
Exceptions	
Includes	
Special Requirements	

Assumptions	User is a registered professional of the office but not the website
Notes and Issues	

Use Case ID	UC - #
Use Case Name	Upload Medical Record
Created By Last Updated	Johnathan Nicholson
Date Created Date Last Updated	October 16, 2016
Actor	Medical Professional
Description	Allow a medical Professional to upload relevant medical documents so that they can only be seen by the medical professional and the patient.
Preconditions	Medical Professional is logged in Medical Professional has the necessary credentials to interface with the medical record system
Postconditions	Patient can see the uploaded document.
Priority	High
Frequency of Use	Medium
Normal Course	

Actor Actions	System Actions
1. Doctor requests a patient's medical records	2. System requests records from records system 3. System returns list of associated medical records
4. Doctor selects a file to fully load 6. Doctor selects to share the selected document.	5. System retrieves file in question from records system 7. System checks that patient this is being shared with is the same as the medical record 8. System presents confirmation dialog

<table>
<tr><td></td><td>
<table>
<tr><td>9. Doctor confirms record and patient</td><td>10. System notifies patient of change in uploaded information
11. System notifies doctor of completion</td></tr>
</table>
</td></tr>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>#.E.2 Medical Records System is down
<table>
<tr><td>Actor Actions</td><td>System Actions</td></tr>
<tr><td>1. Doctor requests associated records</td><td>2. System asks medical records system for records associated with a patient
3. Medical Records system is unavailable
4. System notifies Doctor that the system is unavailable</td></tr>
</table>
#.E.2 Patient is not registered
<table>
<tr><td>Actor Actions</td><td>System Actions</td></tr>
<tr><td>1. Doctor requests associated records</td><td>2. System asks medical records system for records associated with a patient
3. Patient is not found
4. System notifies Doctor that the patient is not registered</td></tr>
</table>
</td></tr>
<tr><td>Includes</td><td></td></tr>
<tr><td>Special Requirements</td><td></td></tr>
<tr><td>Assumptions</td><td>All Patients should be registered with the medical record system</td></tr>
<tr><td>Notes and Issues</td><td>We have no control over the records system. Therefore our system</td></tr>
</table>

	cannot resolve users not having associated data.

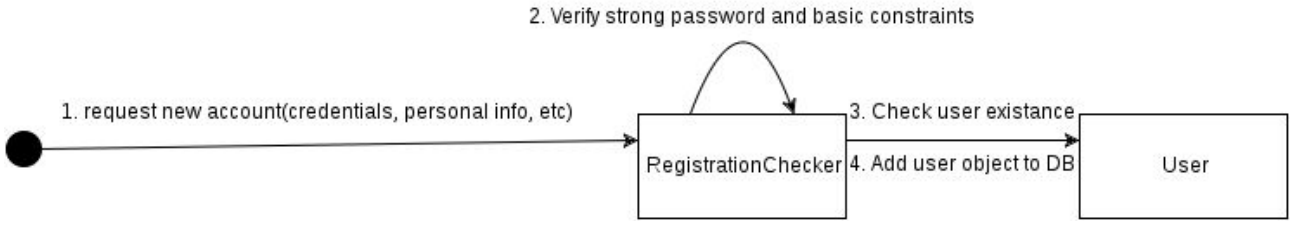
Use Case ID	UC - #
Use Case Name	Edit Patient Care Plan
Created By Last Updated	Johnathan Nicholson
Date Created Date Last Updated	October 16, 2016
Actor	Medical Professional
Description	Allow a Medical Professional to edit and upload information to share with the patient
Preconditions	Medical Professional is logged in
Postconditions	Patient can see the uploaded information.
Priority	High
Frequency of Use	Medium
Normal Course	<table><tr><th>Actor Actions</th><th>System Actions</th></tr><tr><td>1. Doctor requests a patient's current care plan 4. Doctor edits an existing care plan or creates a new care plan</td><td>2. System returns current care plans 3. System saves changes to existing care plan, or creates a new one 5. System notifies patient of change to care plan. 6. System notifies doctor of request completion</td></tr></table>
Alternative Course	**None**

Exceptions	
Includes	
Special Requirements	
Assumptions	Patient is already registered.
Notes and Issues	Administrative assistants cannot access care plans or records, as these documents are considered medical records.

Use Case ID	UC - #
Use Case Name	Register as Medical Professional
Created By Last Updated	Jackson Darrow Jackson Darrow
Date Created Date Last Updated	October 14, 2016 October 14, 2016
Actor	Doctor
Description	A doctor will be able to register an account with the system, the system will be able to verify that they are actually a medical professional.
Preconditions	User has received a ‘verification code’ after providing us with sufficient proof that they are a doctor. User is connected to our website. User does not already have an account.
Postconditions	Doctor level account will be registered with the system.
Priority	High
Frequency of Use	Low
Normal Course	#.0 Doctor creates an account **Actor Actions** | **System Responses**

<table>
<tr><td></td><td>
<table>
<tr><td></td><td>1. System prompts user with a form to input necessary personal information along with a verification code that they receive from us.</td></tr>
<tr><td>2. Doctor inputs their information.</td><td>3. System checks to see that the verification code is valid and has not been used.
4. System creates an account entry in the users database.</td></tr>
</table>
</td></tr>
<tr><td>Alternative Course</td><td>None</td></tr>
<tr><td>Exceptions</td><td>#.E.1 Form is not filled out all of the way
<table>
<tr><td><u>Actor Actions</u></td><td><u>System Responses</u>

1. Display message: <invalid field> is not valid: <reason>
2. Start Normal Course over.</td></tr>
</table>
</td></tr>
<tr><td>Includes</td><td></td></tr>
<tr><td>Special Requirements</td><td>None</td></tr>
<tr><td>Assumptions</td><td>User is a professional Doctor.</td></tr>
<tr><td>Notes and Issues</td><td>None</td></tr>
</table>



5. Other Nonfunctional Requirements

This section contains a list of qualities and requirements the proposed system shall embody and adhere to.

5.1 Performance Requirements

<If there are performance requirements for the product under various circumstances, state them here and explain their rationale, to help the developers understand the intent and make suitable design choices. Specify the timing relationships for real time systems. Make such requirements as specific as possible. You may need to state performance requirements for individual functional requirements or features.>

Minimum Usability Requirements

End User (Patient, Medical Doctor, Administrative Assistant)

- Access to a PC with internet connection.
- Must be able to run a modern web browser (Chrome, Firefox, Safari, Edge)

System Server

- Unix based
- 900 MHz quad core CPU
- 256 MB memory
- Java 1.8 JRE
- Servlet engine
- Web server (Apache)

Since our product is a web based solution, users will need access to a computer with a modern web browser installed. End users that meet these requirements will have access to all of the sites features.

5.2 Safety Requirements

<Specify those requirements that are concerned with possible loss, damage, or harm that could result from the use of the product. Define any safeguards or actions that must be taken, as well as actions that must be prevented. Refer to any external policies or regulations that state safety

issues that affect the product's design or use. Define any safety certifications that must be satisfied.>

PatientNow does not perform any tasks that could directly threaten personal safety or property. In addition PatientNow aims to be fully compliant with ADA dyslexia accommodation guidelines.

5.3 Security Requirements

<Specify any requirements regarding security or privacy issues surrounding use of the product or protection of the data used or created by the product. Define any user identity authentication requirements. Refer to any external policies or regulations containing security issues that affect the product. Define any security or privacy certifications that must be satisfied.>

Due to the sensitive nature of the information we are distributing, our team has come up with a set of guidelines that aims to ensure that the visibility of patient data is achieved by policy. Since our website deals with medical information we also take into account required HIPAA guidelines, which requires there be no 'Admin' (not to be confused with Administrative Assistant) level users.

5.3.1 General

In general all connections to the website are required to use HTTPS. The requirement of modern browsers use also improves the security of our end users. As mentioned before there will not be anyone that has the power to access unauthorized content, including the engineers working with the system.

5.3.2 Patients

All patients are required to enter their username and password before they can have access to their scheduling and medical data. Users can only change their passwords when they are signed in or if they request a 'reset password' and open an email from the website.

5.3.3 Administrative Assistants

Administrative assistants have the permissions to change any patients or doctors schedules and view patient care plans. These users will also log into the site with a username and password. The accounts are created with access codes granted by the Doctors.

5.3.4 Doctors

Doctors will have access to all of the practice's patient care plans and authorized medical records. Since their accounts have the most privileges, they will be required to maintain strong passwords that are replaced every six of months. In order to create a doctor level account a doctor must first verify that he/she is a Medical Doctor with official documentation before they are granted an access code.

5.4 Software Quality Attributes

<Specify any additional quality characteristics for the product that will be important to either the customers or the developers. Some to consider are: adaptability, availability, correctness, flexibility, interoperability, maintainability, portability, reliability, reusability, robustness, testability, and usability. Write these to be specific, quantitative, and verifiable when possible. At the least, clarify the relative preferences for various attributes, such as ease of use over ease of learning.>

5.4.1 Attributes Important to Users

Availability

It's important that our users are able to access our site so that regular dealings at the medical practice can go smoothly rare or nonexistent problems. The site's usage does not have any specific peak hours, meaning that the load will be spread out throughout mainly daylight hours. All site maintenance including updates is to be done at night when most users are expected to be sleeping. With best practices in place the site should be able to maintain 99% uptime.

Reliability

The site will deliver the users content free of bugs or errors. The scheduling component of the software should notify people when things change, and schedules should not disappear or change times due to errors.

Usability

The site's user interface should be understandable and easy to look at. The menu layout will be intuitive to navigate and performing various tasks should take the smallest amount of time as possible.

5.4.1 Attributes Important to Developers

Maintainability

This pertains both to the customers, along with ongoing maintenance of the product down the line. As far as maintenance the entire product will use modern software engineering paradigms like continuous integration and sufficient test coverage. The code itself should be well thought out and use SOLID design principles. As far as updates to our clients (since our product is a self hosted service) updates should be painless and complete within a couple of hours.

5.5 Business Rules

This site must comply with all guidelines specified by both the ADA and the HIPAA. This includes limiting access to medical documents from administrative assistants.

6. Other Requirements

<Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

Appendix A: Data Dictionary

Name	Account Info
Representation	Email Address, Password, Name, Address, Phone Numbers
Format	String
Precision	Exact
Range	Valid email address

Name	User Password
Representation	Password
Format	String
Precision	Exact
Range	Must have 8 or more characters and contain one of each of the following: ● Uppercase letter ● Lowercase letter ● Number ● Symbol

Name	New/Changed Password Info

Representation	2 copies of the same password
Format	Strings
Precision	Exact
Range	2 matching non-empty strings that meet all password security requirements

Name	General Appointment Request
Representation	Preferred professional's name, patient's name, date & time of appointment, appointment type
Format	Data structure containing: 3 strings (names & appointment type) 1 Datetime (appointment start)
Precision	Exact
Range	Datetime within office hours and at least 1 week after request

Name	Final Appointment Info
Representation	Professional's name, patient's name, date & time of appointment, room number, appointment type, duration
Format	Data structure containing: 3 strings (names & appointment type) 2 Ints (room & duration) 1 Datetime (appointment start)
Precision	Exact
Range	Datetime within office hours, professional and room available at that time for the the set duration

Name	Patient Charge

Representation	Patient account, charge name, amount owed, due date, details
Format	Data Structure containing: Strings (name & details), Float (Amount owed), Date
Precision	Exact
Range	Non-empty patient account and charge name strings, float value equal to or greater than 0.0, date on or after current date.

Name	Patient Bill
Representation	Account Name, charges, total amount owed
Format	Data Structure containing: String (account), patient charge data structures, Float (Amount owed)
Precision	Exact
Range	Non-empty account string, float value equal to or greater than 0.0

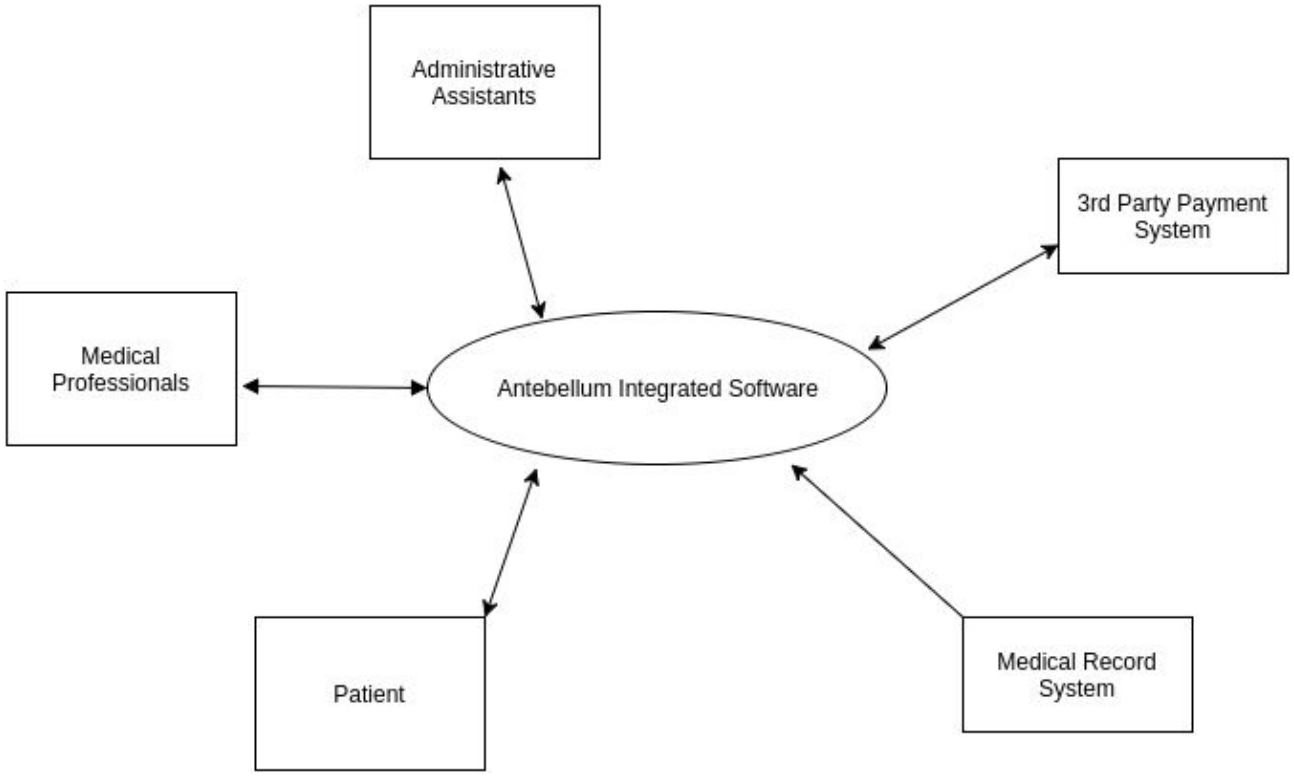
Name	Professional Schedule
Representation	List of dates and times professional is in office, list of dates and times professional has appointments
Format	Data Structure containing 2 lists of datetimes
Precision	15 min intervals
Range	All appointment times entries are limited to the range of availability times.

Name	Professional Schedule
Representation	List of dates and times professional is in office, list of dates and times professional has appointments

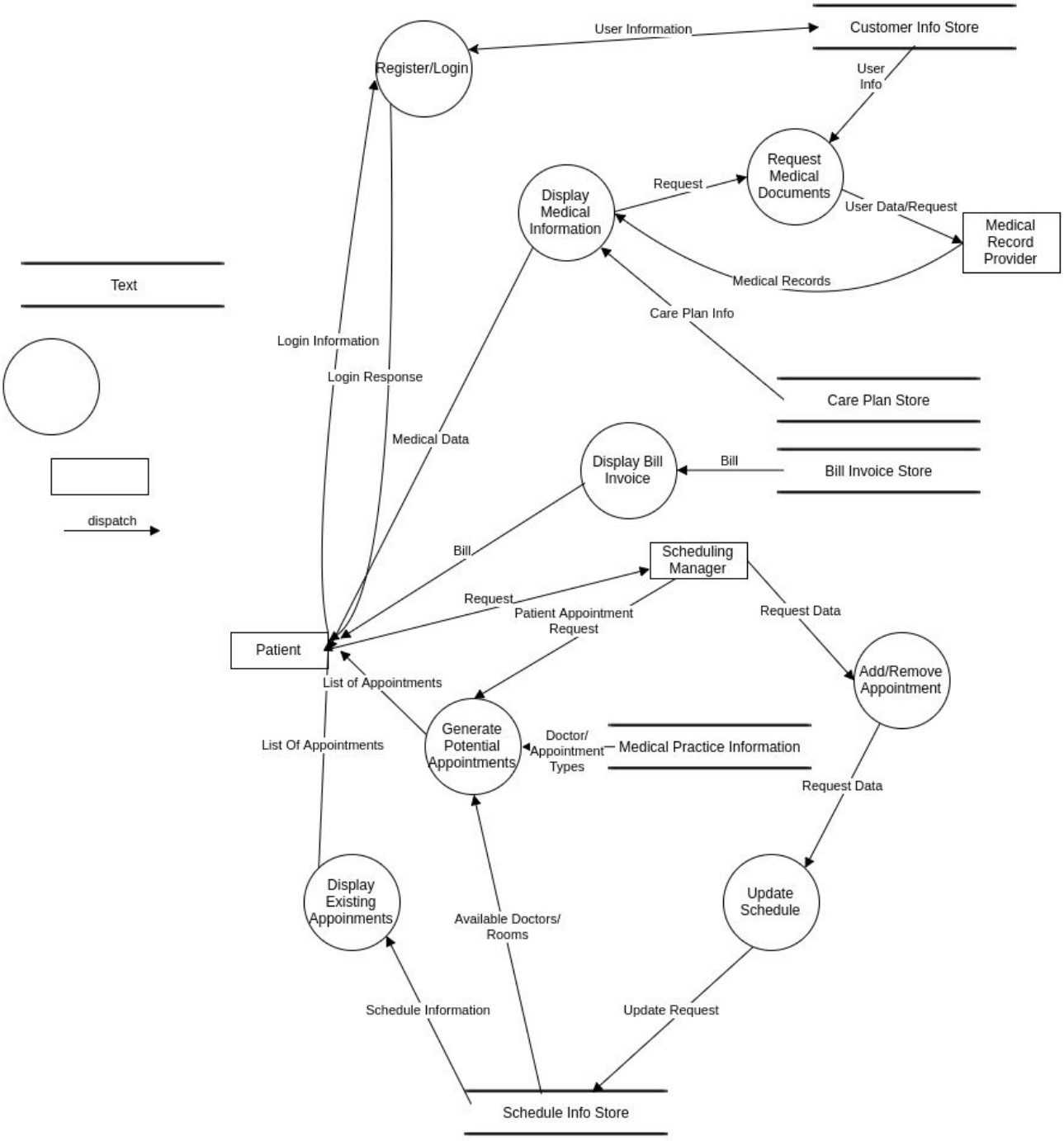
Format	Data Structure containing 2 lists of datetimes
Precision	15 min intervals
Range	All appointment times entries are limited to the range of availability times.

Appendix B: Analysis Models

Level 0 DFD



Level 1 DFD


Customer Info Store
User Information
Register/Login
User Info
Request Medical Documents
Request
Display Medical Information
User Data/Request
Medical Record Provider
Medical Records
Text
Care Plan Info
Login Information
Login Response
Care Plan Store
Medical Data
Display Bill Invoice
Bill
Bill Invoice Store
dispatch
Bill
Scheduling Manager
Request
Patient Appointment Request
Request Data
Patient
List of Appointments
Add/Remove Appointment
Generate Potential Appointments
List Of Appointments
Doctor/ Appointment Types
Medical Practice Information
Request Data
Display Existing Appoinments
Available Doctors/ Rooms
Update Schedule
Schedule Information
Update Request
Schedule Info Store

Appendix C: To Be Determined List

<Collect a numbered list of the TBD (to be determined) references that remain in the SRS so they can be tracked to closure.>