Loop Solutions Inc.

For Self Start System

Version 1.9



Revision History

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| --- | --- | --- | --- |
| **Date** | **Version** | **Description** | **Author** |
| 09/11/2017 | 1.0 | Created UML Use Case Diagram with group | Everyone |
| 14/11/2017 | 1.1 | Updated Use Cases and Use Case Diagram | Everyone |
| 15/11/2017 | 1.2 | Completed Actor and Use Case descriptions, Introduction and, Survey Description for Task Two | Samuel Mallabone, Andrew Black |
| 15/11/2017 | 1.3 | Completed Interface and Applicable Standards | Robert Northmore |
| 15/11/2017 | 1.4 | Completed Supportability, Design Constraints, User Online Documentation and Help System Requirements | Craig Cook |
| 15/11/2017 | 1.5 | Completed Use-Case Model Hierarchy | Samuel Mallabone, Andrew Black |
| 15/11/2017 | 1.6 | Completed Licensing Requirements, Legal, Copyright and Others Notices | Andrew Black, Samuel Mallabone |
| 16/11/2017 | 1.7 | Completed Purpose, Scope, and Functional Requirements | Jak Terpak |
| 16/11/2017 | 1.8 | Completed Usability, Reliability, and Performance | Stephanie Pereira |
| 16/11/2017 | 1.9 | Final Review of the document | Everyone |

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# Introduction

## Purpose

The purpose behind the development of The Marcotte Physiotherapy Self Start system is to provide patients an easy and interactive application to browse their profiles, make appointments, and review the exercises that were recommended to them from the physiotherapist. The application should be easy for the everyday user to interact with, and run without any technical glitches. This project will also utilize a database that will hold all the patient records, exercises, and other necessary elements.

## Scope

The Self Start system will be a set of scripts that interact directly with the database containing users, forms, different exercises and sets of exercises. The administrator of the physiotherapy application will be able to manage the various items within the database, by being able to add, edit, and delete entries within the database. This application will provide an easy way for various patients to manage their profiles and have streamline access to booking appointments and communicating with the physiotherapists. This software will guarantee user friendly interaction that will result in user satisfaction.

The overall design goal of this system is to create an application for Marcotte Physiotherapy that will allow patients to sign in, view their rehabilitation plan, and schedule future appointments. Some of the main functionalities on the back end will be, keeping the user’s information secure, and proper interactions between the application and the database.

## Definitions, Acronyms and Abbreviations

|  |  |
| --- | --- |
| **Term** | **Definition** |
| SRS | Software Requirements Specification. The document that describes the software system that is to be developed, including the functional requirements, non-functional requirements and the use cases and their interaction with the actors. |
| GUI | Graphical User Interface. |
| Ember | An open-source JavaScript web framework, based on the model-view-model pattern. |
| Socket (also known as Network Socket) | An internal endpoint for sending or receiving data at a single node in a computer network. |
| Dev Team | Short for Development Team. |
| Browsera | An online interface for testing cross platform compatibility for websites. |
| Github | A platform that allows developers to easily manage versions control for programming projects. |
| PayPal | Online payment company, who’s technology will facilitate the online payment feature of Self Start. |
| API | Application Programmable Interface. |

## References

Marcotte, S (2017). Home. [online] Marcotte Physiotherapy Clinic. Available at: http://marcottephysio.com/ [Accessed 13 Nov. 2017]

Smash Studios (2017) “SE3352a: Software Requirements and Analysis”. SE 3352 Software Requirements and Analysis. Western University. Available at: https://owl.uwo.ca/access/content/attachment/672f3446-c1d2-46a8-9426-90707ad34952/Assignments/ebd4ffa0-856c-4c9a-9553-4406f8a34b1f/SmashStudios\_SRS.pdf [Accessed 13 Nov. 2017]

## Overview

In the following section within the SRS document, entitled Overall Description, an overarching summary of the systems final deliverable requirements will be outlined and explained. The purpose of this is to shed light on the context of the third and final section in a less technical sense. Through this high-level approach, section two is able to delve into the functionality of the system without straining the reader with technical terms and descriptions.

The final section of this document is tailored to a more technical audience and will delve into the specific functionalities of each use case. Laying the groundwork for the implementation of the Self Start system.

# Overall Description

## Use-Case Model Survey

### Introduction

This document refers to a use case very often. A use case is a development tool used to describe specific functionality aspects of the overall system. Use cases can provide a visual representation of the system interactions between actors (which are external to the system), and the basic functionality and event flow of the system. The use cases described later in this document collectively make up the functionality of the Self Start system, working to help bring the excellent treatment provided by Marcotte Physiotherapists into the end users home. The Self Start System will ultimately be used by Physiotherapists to treat the ailments and injuries of their Patients.

### Survey Description

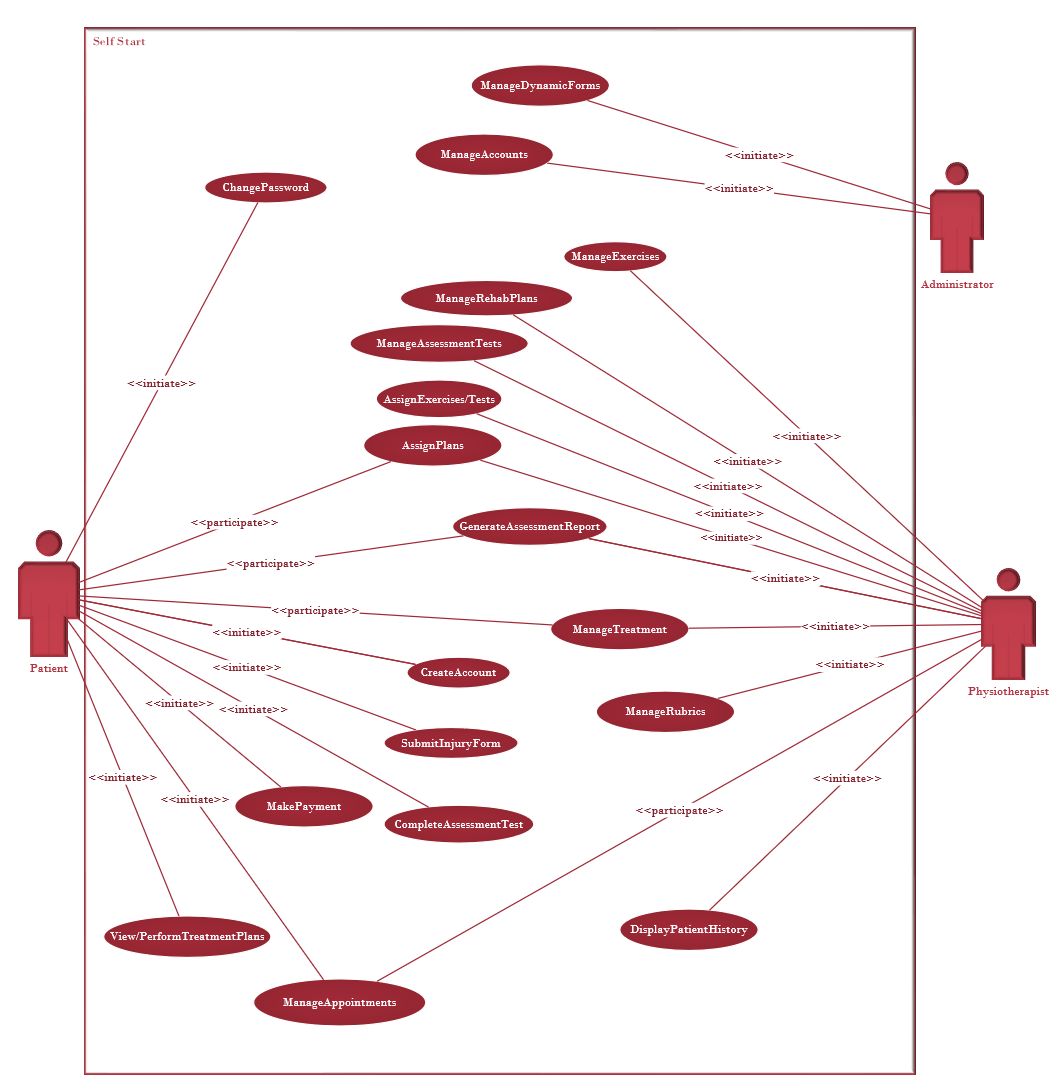
The Self Start system is a web based patient treatment system that will allow for Physiotherapists to rehabilitate patients through online interactions as opposed to in-person visits. The purpose of the system is to create an easier way for Patients to receive the treatment they need without having to consult a physiotherapist in-house at a clinic. The systems main functionality is to provide treatment to Patients via online rehabilitation and treatment plans, overseen by their Physiotherapist. Additionally, some functionality of the system is maintained by the Administrator who can manage specific users and forms within the system. Lastly, based on the role of the user after login the site should display the appropriate user-interface pertaining to that user.

### Use-Case Model Hierarchy

|  |  |
| --- | --- |
| **Actors** | **Descriptions** |
| Patient | The Patient utilizes the system in-order to receive their desired medical assistance via a Physiotherapist. |
| Administrator | The Administrator maintains Patient and Physiotherapist accounts within the system as well as make relevant changes to the dynamic forms within Self Start |
| Physiotherapist | The Physiotherapist utilizes the system in order to communicate, treat and store about their patients. |

|  |  |
| --- | --- |
| **Use Case** | **Description** |
| ManageDynamicForms | Self Start allows the Administrator to make any required changes to the dynamic forms that exist within the system. |
| ManageAccounts | Self Start allows the Administrator to add, edit or delete Patient or Physiotherapist accounts from the system. The Admin can also reset passwords upon request. |
| ManageExercise | Self Start allows Physiotherapists to add, edit or delete exercises. |
| ManageRehabPlans | Self Start allows Physiotherapists create, edit or delete standard and custom rehab plans. |
| ManageAssessmentTests | Self Start allows Physiotherapists to add, edit or delete assessment tests. |
| AssignExercises/Tests | Self Start allows a Physiotherapist to add exercises and tests to rehab plans and assessment tests. |
| AssignPlans | Self Start allows a Physiotherapist to assign rehab plans and assessment tests to Patient’s that are assigned to them. |
| GenerateAssessmentReport | Self Start allows a Physiotherapist to generate assessment reports about one of their assigned Patient’s. |
| ManageTreatment | From the results of a Patient’s assessment tests, the Self Start system allows the Patient’s Physiotherapist to make decisions about the future of their treatment. |
| ManageRubrics | Self Start allows a Physiotherapist to add, update or delete rubrics. |
| DisplayPatientHistory | Self Start allows a Physiotherapist to display all of the information about one of the Patient’s assigned to them. |
| ChangePassword | Self Start allows a Patient to change their password that is stored within the system. |
| CreateAccount | Self Start allows an individual to create an account in the Self Start system. |
| SubmitInjuryForm | Self Start allows a non-registered user to submit an injury form. |
| CompleteAssessmentTest | Self Start allows a Patient to complete an assessment test that is assigned to them by their Physiotherapist. |
| MakePayment | Self Start allows a Patient to pay any outstanding fees that they owe. |
| ManageAppointments | Self Start allows a Patient to book or cancel appointments with their Physiotherapist. |
| View/PerformTreatmentPlans | Self Start allows a Patient to view or perform any of the treatment plans that are assigned to them. |

### Diagrams of the Use-Case Model



## Assumptions and Dependencies

The Dev Team believes that no assumptions or dependencies regarding any major technical feasibility, subsystem or component availability, or other project related assumptions on which the viability of the software described in this document have been made.

# Requirements

# 

## Use-Case Specifications

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| --- | --- |
| **Use case name** | ManageDynamicForms |
| **Participating actors** | Initiated by Administrator |
| **Entry condition** | The Administrator has successfully logged in to Self Start. |
| **Flow of events** | 1. The Administrator selects the manage dynamic form option.  2. Self Start responds by displaying a screen showing all dynamic forms within the system along with the options add, change or delete them.  3. The Administrator selects one of the forms to manage (change or delete). Alternatively, they can choose to add a new dynamic form to Self Start.  4. Self Start saves the changes made to the dynamic forms and displays the updated forms. |
| **Exit condition** | Self Start confirms the changes made to the system and all future requests includes these changes. |
| **Quality requirement** | **None** |

|  |  |
| --- | --- |
| **Use case name** | ManageAccounts |
| **Participating actors** | Initiated by Administrator. |
| **Entry condition** | The Administrator has successfully logged in to Self Start. |
| **Flow of events** | 1. The Administrator selects the manage accounts option in Self Start.  2. Self Start responds by showing the manage accounts window which displays all current accounts registered to the system, both Patient and Physiotherapist.  3. For each Physiotherapist or Patient, the system displays their name (family name, given name), gender, date of birth, address (city, region, postal code), telephone number, health card number, marital status, occupation and others.  4. The Administrator chooses to manage an account (update, delete) or to create a new Patient or Physiotherapist account. If creating a new account, the Administrator must fill in all the required information. If a password change request is filled by the User, the administrator proceeds with updating their Account.  5. Depending the Administrator actions, the registered accounts within the system will update accordingly. |
| **Exit condition** | Self Start saves all changes made to the registered accounts. |
| **Quality requirement** | At any given time, the Administrator can choose to filter the list of accounts to only show Patients or Physiotherapists. |

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| --- | --- |
| **Use case name** | ManageExercises |
| **Participating actors** | Initiated by Physiotherapist |
| **Entry condition** | The Physiotherapist has successfully logged in to Self Start. |
| **Flow of events** | 1. The Physiotherapist has clicked on the manage exercise button.  2. Self Start directs the Physiotherapist page where they can create, update, or delete an exercise.  3. The Physiotherapist makes their desired changes and submits these to the system.  4. The Self Start system saves the changes that the Physiotherapist has made. |
| **Exit condition** | All changes to Self Start have been saved to the database. |
| **Quality requirement** | **None** |

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| --- | --- |
| **Use case name** | ManageRehabPlans |
| **Participating actors** | Initiated by Physiotherapist. |
| **Entry condition** | The Physiotherapist has successfully logged in to the Self Start. |
| **Flow of events** | 1. The Physiotherapist chooses the manage rehab plans button.  2. Within the manage rehab plans tab, the Physiotherapist can create (standard or custom), manage or update existing plans.  3. For each rehab plan, the system displays its unique identification code, name, description, author name, overall rehabilitation goal, list and order of exercises, a time frame to complete the plan and the assessment tests.  4. The Physiotherapist manages these rehab plans however they choose too. If they choose to create a new plan they must fill out all the required forms.  5. The system reflects any Physiotherapist changes. |
| **Exit condition** | Self Start reflects the changes to the plans and updates the database. |
| **Quality requirement** | The Physiotherapist must completely fill out all the required forms properly before submitting the new plan. |

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| --- | --- |
| **Use case name** | ManageAssessmentTests |
| **Participating actors** | Initiated by Physiotherapist |
| **Entry condition** | The Physiotherapist has successfully logged in to Self Start |
| **Flow of events** | 1. The Physiotherapist chooses the manage assessment tests button.  2. Upon the button being clicked, the Self Start system displays all the registered assessment tests along with their unique identification code, name, description, author name, assessment tools and, assessment rubric.  3. Self Start gives the Physiotherapist the option to create a new assessment test, update an existing one or delete an existing one.  4. The Physiotherapist manages the assessment tests. If they choose to create a new one, they must fill in the appropriate information.  5. Self Start reflects the updated information altered by the Physiotherapist. |
| **Exit condition** | Self Start saves all changes made to the assessment tests to the database. |
| **Quality requirement** | The Physiotherapist must completely fill out all the required forms properly before submitting the new tests. |

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| **Use case name** | AssignExercises/Tests |
| **Participating actors** | Initiated by Physiotherapist |
| **Entry condition** | The Physiotherapist has successfully logged in to Self Start |
| **Flow of events** | 1. The Physiotherapist clicks on the assign exercise and tests button.  2. The system responds by displaying the assign exercise and tests screen for the Physiotherapist.  3. The Physiotherapist is able to assign an exercise or an assessment test to a desired plan.  4. Self Start updates the rehabilitation plan according to the Physiotherapist ‘s input. |
| **Exit condition** | The system saves all changes to the rehabilitation plans, in the database, performed by the Physiotherapist. |
| **Quality requirement** | The Physiotherapist cannot send the same exercises or tests to the same user multiple times. |

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| --- | --- |
| **Use case name** | AssignPlans |
| **Participating actors** | Initiated by Physiotherapist. Participated in by Patient. |
| **Entry condition** | The Physiotherapist has successfully logged in to Self Start. |
| **Flow of events** | 1. The Physiotherapist selects the assign plans button.  2. Self Start will display all Patient’s that are currently being treated by the Physiotherapist. It will only display the user’s name.  3. The Physiotherapist selects one of the Patient’s from the list presented to them.  4. Self Start then displays only the user’s name, gender, age and their injury report.  5. The Physiotherapist designates a rehabilitation plan, either standard or custom, to the selected Patient.  6. Self Start updates the Patient’s treatment plan with the selected rehabilitation plan designated by the physiotherapist. Self Start then sends the Patient a notification that new plan has been has been added to their treatment plan. |
| **Exit condition** | Self Start saves the updated Patient’s treatment plan to the database and contacts the user based on the changes. |
| **Quality requirement** | The Patient must receive the notification within a reasonable time-period. |

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| --- | --- |
| **Use case name** | GenerateAssessmentReport |
| **Participating actors** | Initiated by Physiotherapist. Participated in by Patient. |
| **Entry condition** | The Physiotherapist has successfully logged in and a user has completed their assessment test. |
| **Flow of events** | 1. The Physiotherapist has selected the generate assessment report button.  2. Self Start directs them to a window that shows all their designated users.  3. The Physiotherapist selects the desired user given they have completed an assessment test.  4. Self Start displays the current assessment plan and examination result for the user as well as their completed associated rubrics to the assessment tests.  5. The system displays the following options to the Physiotherapist: print/send an examination summary with the user’s corresponding treatment plan. Based off the assessment tests and rubrics the system generates data analysis to show the physiotherapist, as well as generate a summary report (which includes patient personal information, the diagnose case, the treatments, the appointment calendar, invoice payments and the final outcome) to be displayed or printed.  6. The Physiotherapist chooses one of the options displayed by the Self Start system.  7. Based off the Physiotherapists decision, the system completes the desired action and notifies the Patient if necessary. |
| **Exit condition** | The system updates the required information pertaining to the Patient’s treatment. If necessary, the Patient is notified by the system regarding the changes to their treatment plan. |
| **Quality requirement** | The Patient must receive the notification within a reasonable time-period. |

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| --- | --- |
| **Use case name** | ManageTreatment |
| **Participating actors** | Initiated by Physiotherapist. Participated in by Patient |
| **Entry condition** | The Physiotherapist has successfully logged in to the system. |
| **Flow of events** | 1. The Physiotherapist selects the manage treatment button.  2. Self Start displays a list of all the Patient’s assigned to the Physiotherapist.  3. From this presented list, one of the Patient’s is selected by the Physiotherapist.  4. Based off the Patient’s past assessment test results, the Self System will recommend a course of action. The options to continue treatment or close treatment is presented to the Physiotherapist along with the treatment rubrics.  5. The Physiotherapist acknowledges system’s recommendations along with the assessment rubrics and selects a treatment option.  6. The system notifies the Patient based on the action taken. |
| **Exit condition** | The system sends the Patient a note that they’re treatment will continue OR the system sends the Patient a note that their treatment is concluded. |
| **Quality requirement** | The Patient must receive the notification within a reasonable time-period. |

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| --- | --- |
| **Use case name** | ManageRubrics |
| **Participating actors** | Initiated by Physiotherapist |
| **Entry condition** | The Physiotherapist has successfully logged in. |
| **Flow of events** | 1. The Physiotherapist selects the manage rubrics button.  2. The Self Start system displays the screen with all the registered rubrics within the database. The options to create, update or delete rubrics are shown to the Physiotherapist.  3. The Physiotherapist selects one of the options that is presented to them.  4. The system reflects all changes made to the rubrics. |
| **Exit condition** | All changes to the rubrics are saved to the database by the system. |
| **Quality requirement** | The rubric rating systems must be clear and easy for the Patient to understand. |

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| --- | --- |
| **Use case name** | DisplayPatientHistory |
| **Participating actors** | Initiated by Physiotherapist. |
| **Entry condition** | The Physiotherapist has successfully logged in to the system and have selected to see all users. |
| **Flow of events** | 1. The Physiotherapist chooses a Patient from their list of assigned Patients.  2. The system displays all assessment tests through the Patient’s progression through their treatment. |
| **Exit condition** | The Patient’s history has been successfully retrieved and displayed. |
| **Quality requirement** | **None** |

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| --- | --- |
| **Use case name** | ChangePassword |
| **Participating actors** | Initiated by Patient |
| **Entry condition** | The Patient has successfully logged in. |
| **Flow of events** | 1. The Patient selects to the change password button from their account settings.  2. The system displays a form to the Patient prompting them to re-enter their old password and then enter their new password twice.  3. The Patient enters all requested information.  4. The system verifies all the information and that the new password is identical in the two textboxes. It then sends a confirmation message whether the request was successful or unsuccessful.  5. If the Patient couldn’t log in because they were unable to enter the correct password due to any circumstance, they can request to have their password reset by the Administrator.  6. Self Start notifies the Administrator of the password change request. |
| **Exit condition** | The Patients password has been successfully changed and is updated within the database OR the Patients request to change their password was denied as their old password was entered incorrectly or the two new passwords entered don’t match. |
| **Quality requirement** | The new password must be at-least eight letters long, contain at least one capital letter, and either one or more symbols or numbers. If there is an error in changing the password, the system must indicate the present error to the user. |

|  |  |
| --- | --- |
| **Use case name** | CreateAccount |
| **Participating actors** | Initiated by Patient |
| **Entry condition** | The Patient has accessed the Self Start website. |
| **Flow of events** | 1. The Patient selects the register account button on the home page.  2. Self Start responds by displaying the sign-up form, prompting the user to enter a username(email) and password. Additionally, they must enter their full name, gender, date-of-birth, address, telephone number, health card number, marital status, occupation and any additional information.  3. The Patient fills in all required information and submits the form.  4. The Self Start system checks if the information is valid (i.e. email not in user) use and replies to the Patient. |
| **Exit condition** | Self Start alerts the Patient that their account was successfully and saves the account to the database OR Self Start alerts the Patient some information was entered invalidly and prompts them to correct it. |
| **Quality requirement** | If all the required entries are not correctly filled out, the system must prompt the user to the field in which the error persists. |

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| --- | --- |
| **Use case name** | SubmitInjuryForm |
| **Participating actors** | Initiated by Patient |
| **Entry condition** | The successfully created/logged in to their account in Self Start. |
| **Flow of events** | 1. The Patient navigates to the submit injury form option.  2. The Self Start system displays the form to the Patient and prompts them to enter general information about their injury.  3. The Patient fills out all required information.  4. The system acknowledges the information entered, determines if the all required information has been entered correctly, and responds accordingly. |
| **Exit condition** | The information has been entered correctly, the system saves all the information to the database and contacts a physiotherapist OR the system determines that information has be incorrectly entered and the user is prompted to fix it. |
| **Quality requirement** | If all the required entries are not correctly filled out, the system must prompt the user to the field in which the error persists. |

|  |  |
| --- | --- |
| **Use case name** | CompleteAssessmentTest |
| **Participating actors** | Initiated by Patient |
| **Entry condition** | The Patient has successfully logged in to their account within Self Start and have an active rehabilitation plan with assessment tests. |
| **Flow of events** | 1. The Patient navigates to the treatment plan page and selects the complete assessment test option.  2. The system brings up all Patient’s relevant assessment tests assigned to them from a treatment plan.  3. The Patient now fills out the Assessment Test.  4. The system updates the related assessment rubrics and updates the progress by the Patient within the treatment plan. |
| **Exit condition** | The system updates the filled-out assessment tests within the database for the Patient’s Physiotherapist to see. |
| **Quality requirement** | If all the required entries as well as the rubric are not correctly filled out, the system must prompt the user to the field in which the error persists. |

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| --- | --- |
| **Use case name** | MakePayment |
| **Participating actors** | Initiated by Patient |
| **Entry condition** | The Patient has successfully logged in to Self Start and outgoing payment to be made. |
| **Flow of events** | 1. The Patient selects the make payment button.  2. Based on their past requests (ie. Booking an initial or supplementary appointment) the system displays the required payment amount. A form is also provided for to enter their payment information.  3. The Patient enters their payment information and clicks the submit button.  4. The system processes the payment, checking to see if the information provided is valid and responds accordingly. |
| **Exit condition** | The Patient has entered valid information and the system displays that the payment was successfully processed OR the Patient has entered incorrect information and the system prompts the Patient to enter correct their information. |
| **Quality requirement** | The system must use HTTPS to ensure that the payment request sent to the system is secure. If all the required entries are not correctly filled out, the system must prompt the user to the field in which the error persists. |

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| --- | --- |
| **Use case name** | ManageAppointments |
| **Participating actors** | Initiated by Patient. Participated in by Physiotherapist. |
| **Entry condition** | The Patient has accessed the Self Start website |
| **Flow of events** | 1. The Patient selects the manage appointments button.  2. The system checks if the Patient has already logged in. If they have not they are taken to the initial appointment page where they can request an initial appointment or fill out an injury form. Otherwise, the Patient is logged in and is shown the book follow-up appointment screen.  3. The logged in Patient can either request a supplementary appointment, and/or cancel future appointments they have already booked as they choose.  4. The system acknowledges these changes made and displays a confirmation message to the Patient if their requests were successfully completed. |
| **Exit condition** | The system displays a confirmation message to the Patient that their requests were successful and have been saved. The system saves these changes to the database. |
| **Quality requirement** | The Patient can select from a range of available appointments times with their Physiotherapists. |

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| --- | --- |
| **Use case name** | View/PerformTreatmentPlans |
| **Participating actors** | Initiated by Patient. |
| **Entry condition** | The Patient has successfully logged in and has a treatment plan assigned to them. |
| **Flow of events** | 1. The Patient navigates to their treatment plan page.  2. The system responds by displaying their treatment plan history and current status.  3. The Patient chooses to either view their progression through their treatment plan, view their current treatment plan or proceed with the next steps of their treatment plan (i.e. complete an assessment test).  4. The system acknowledges the Patient’s request and displays the appropriate page. |
| **Exit condition** | The system has successfully fulfilled the Patient’s request and the Patient is displayed the correct screen. |
| **Quality requirement** | If all the required entries as well as the rubric are correctly filled out, the system must prompt the user to the field in which the error persists. |

## Functionality

### Functional Requirement One

The system should be able to run with the same functionality on all browsers. The application should show a main page, a welcome and an attractive message in addition to a full description of the services provided by the system.

### Functional Requirement Two

The System must provide Patients who wish to contact the clinic for the first time an option to request an appointment or fill out and submit an online form explaining the injury.

### Functional Requirement Three

The Patient should be able to book appointments online and receive a verification message.

### Functional Requirement Four

The system must provide an online form to help the Patients explain their injury and submit the form to the system. The form will have a set of predetermined questions set by the Physiotherapist.

### Functional Requirement Five

The system Administrator must be allowed to add, change or delete the questions from the introduction form at their discretion.

### Functional Requirement Six

The Patient must complete an online profile within the application in order to receive treatment (i.e. no guest user).

### Functional Requirement Seven

The Patient can update their password. The system Administrator can also reset passwords for the Patient if they have forgotten.

### Functional Requirement Eight

The system must maintain and save the personal information of Patients. Such as Name, Gender, Date of Birth, Phone Number, Heath Card Number, Address, Occupation etc.

### Functional Requirement Nine

The Physiotherapist must be allowed to create the clinic-defined standard rehabilitation plans that include exercises and self-assessment activities. These will be used for common injuries.

### Functional Requirement Ten

The Physiotherapist should be able to create new exercises and add those exercises to plans.

### Functional Requirement Eleven

The Physiotherapist should be able to combine certain exercises in order to create custom rehab plans for different Patients.

### Functional Requirement Twelve

The system will maintain the following information for each rehab plan, Unique ID code, Name, Description, Author Name, Overall Rehabilitation Goal, List and order of exercises, Timeframe of plan, Assessment tests.

### Functional Requirement Thirteen

The Physiotherapist must be able to assign a set of assessment tests to the custom rehab plan.

### Functional Requirement Fourteen

The system should maintain the following information for each exercise, Unique ID, Name, Description, Author Name, Objectives, Action Steps, Location, Frequency and Duration, Target Date, Multimedia URL.

### Functional Requirement Fifteen

The system should maintain the following information on each assessment test, Unique ID, Name, Description, Author Name, Assessment tools, Assessment rubric.

### Functional Requirement Sixteen

The Physiotherapist may apply one or more rehab plans to one or more patients.

### Functional Requirement Seventeen

The Physiotherapist should have the ability to print the examination findings or send a summary directly to the Patient.

### Functional Requirement Eighteen

The Patients must be able to navigate the web application and view their exercises through menu options, and text based guidance.

### Functional Requirement Nineteen

The Patients enter their responses to the assessments test questions via an online form. Based on the assessment test the system should record the test results and assess their future treatment.

### Functional Requirement Twenty

Physiotherapists should be able to generate data analysis based on the assessment tests that reflect the impact of the rehab plans. The Physiotherapist should be allowed to assign a follow-up session with the Patient or close the case.

### Functional Requirement TwentyOne

The Physiotherapist should be able to display or print a summary report for each Patient. The report should include: Patient personal information, the diagnosed case, the treatments, calendar for appointments, invoices payment and the final outcomes.

### Functional Requirement Twenty-Two

The System needs to be installed and hosted by the Marcotted Physiotherapy Clinic server that is capable of running Node.js framework.

### Functional Requirement Twenty-Three

The system must use HTTPS as its internet communication protocol to generate secure encryption keys between the web server and the Patient’s browsers.

### Functional Requirement Twenty-Four

The system must have an Administrator account, and two user roles: Patient and Physiotherapist.

### Functional Requirement Twenty-Five

The system Administrator should be allowed to create user accounts for Patients and/or Physiotherapist users, and disable or enable existing accounts.

### Functional Requirement Twenty-Six

The system should accept online payment.

## Usability

### Usability Requirement One

With a very user-friendly software, time required to familiarize oneself with the system will be low for both Patients and Physiotherapists. The application will not require any previous knowledge of computer hardware, operating systems, programs, or web sites that the average user would not already possess.

### Usability Requirement Two

Basic tasks such as create account, book appointment and make payment will be easy to navigate and take the user approximately 3-5 clicks to complete. The actual time it takes to complete tasks will vary greatly depending on how long it takes the user to fill out required information. However, with the short and simple steps provided it should take them no more than 10 minutes to complete certain assessments.

### Usability Requirement Three

A favored usability requirement that will be implemented is a loading bar that will be displayed if the system takes longer than usual to complete a task. This feature is used to provide comfort to the user so they know their input has been received and is currently being processed.

### Usability Requirement Four

The application will implement the IBM Common User Access (CUA) Standards and Microsoft User Interface Standards to maximize usability and improve the user’s experience. This includes features such as an action bar, a toolbar (to print or send documents), pop-up windows, drop-down menus, and a help menu that can be accessed if the user has any questions.

## Reliability

### Reliability Requirement One

Availability: The system is intended to be available 100% of the time. This will allow users to gain access to the system any hour of the day at their convenience. If maintenance is required, a 5-day notice (with the estimated duration) will be displayed on the home page to inform users.

### Reliability Requirement Two

Mean Time Between Failures (MTBF): The mean time between failures should not exceed 15 hours. The system should detect failures and notify maintenance team immediately, so they can determine the source of the failure and begin repairs.

### Reliability Requirement Three

Mean Time to Repair (MTTR): The mean time to repair failures should take a maximum of 8 hours. It should also take a maximum of 7 hours for the maintenance team to determine the source of the failure, resulting in a total MTBF of 15 hours.

### Reliability Requirement Four

Accuracy: Accuracy is extremely important when it comes to payment. Two decimal places will be used when calculating the amount owed from the user before being redirected to a payment API. Accuracy on testing assessment results will be limited to the scale for each rubric.

### Reliability Requirement Five

Maximum bugs or defect rate: The system should have a maximum of 2 bugs/KLOC that can be easily fixed and are not noticeable by the user. If the system exceeds 2 bugs/KLOC then they must be fixed immediately so they do not create an error.

### Reliability Requirement Six

Bugs or defect rate:

* Minor bugs: unnoticeable by the user and can be easily fixed.
* Significant bugs: noticeable by user, results in alteration of data
* Critical bugs: results in complete loss of data and/or inability to use certain parts of the system.

If detected, any significant or critical bugs must be fixed immediately to prevent incorrect system output or functionality.

## Performance

### Performance Requirement One

Response time: The response time for transactions should appear instantaneous in almost all cases. This includes basic transactions such as modify user accounts or view treatment plans. Other transactions such as book appointment or process payment may take up to 5 seconds to perform.

### Performance Requirement Two

Capacity: The system can accommodate around 250 users at any given time.

### Performance Requirement Three

Throughput: The system can perform 50 transactions per second, assuming a capacity of 250 users and a response time of 5 seconds.

### Performance Requirement Four

Degradation modes: If a malicious event occurs, the system will enter a degradation or reduced mode. The system will display a message to the user informing them that an error is present and then limit the provided services to only those that are necessary.

### Performance Requirement Five

Resource utilization: The system will require cookie storage for its resources.

## Supportability

### Supportability Requirement One

GitHub will be used for version control during the rapid app development process to ensure accuracy and consistency throughout the life cycle. Versions will be individually committed by each developer until finished, allowing for a modular programming architecture to isolate system functionality aspects. Towards the end of development, the collection of all versions to form a final report that can be found in a single location.

### Supportability Requirement Two

The webpage should be available and accessible on any web browser the customer wishes to view it on. Cross-browser support systems will be introduced to ensure the developers priority to create a supported application, and will be maintained for a variety of different devices. Browsera is a free to download application used to compare browser output and report Javascript errors that might arise from various browsers.

### Supportability Requirement Three

The system needs to be installed and hosted on the Marcotte Physiotherapy Clinic central server that is capable of running Node.js framework. The software team will develop the system in a way that allows for compatibility on the Clinic’s central server, maintained as needed in order to ensure availability 24/7 for patients.

### Supportability Requirement Four

PayPal API will be adopted to handle user payment transactions on the webpage with verification. PayPal’s reputable brand name third party interface will prevent any errors that might arise from building a unique payment system from scratch. Embedding this in the system offers peace of mind for the clients that their money is being handled with care.

### Supportability Requirement Five

New video exercises and tutorials will be added regularly to avoid staleness of an out-of-date website. Material will be added to the website to ultimately better the patient’s experience by allowing access to as much useful content as possible.

## Design Constraints

### Design Constraint One

The Self Start system holds private information about a variety of patients, including medical and billing information. As a result, it should be heavily protected to maintain privacy between patients, and abide by any and all Physician-Patient confidentiality laws. This will be completed by using HTTPS as its internet communication protocol to generate secure encryption keys between the server and client browser’s.

### Design Constraint Two

The exercise tutorial videos uploaded on the web application must be accurate, and free from flaws in technique. The videos must be easy to follow along with, considering it will be serving patients of all levels of capability.

### Design Constraint Three

The webpage should be constructed in a way that includes menu items, guidance, and animations that allow for smooth and easy access throughout the Patient’s experience. The user should not spend a lot time to understand how to use the application, but instead be seamlessly introduced to the format of functionalities in order to get the full efficiency out of Self Start’s online physiotherapy service.

### Design Constraint Four

The database containing scheduling information on the Physiotherapists will be created in such a way that prevents conflicts between appointments. If a Patient has previously booked an appointment with a Physiotherapist, a different patient cannot schedule an appointment for that time with the same Physiotherapist. The database will continuously update to keep scheduling information accessible at all times to ensure this is not the case.

## Online User Documentation and Help System Requirements

The Developers plan to complete the program under the rules of modular programming and delegated individual tasks. Delegated tasks ensure that each developer is an expert in at least one area of the entire system, and can provide a complete technical documentation on the system with combined knowledge. The documentation and system help will be consistent and thorough, yet still basic enough for the system Administrator to follow when they have any questions or concerns with how the program is supposed to operate. The Self Start system will include 1 year worth of personal support from any or all team members, and provide each member’s contact information, since all of the developers are returning for concurrent academic years at Western University they will be available.

## Purchased Components

As the system developers are not qualified physiotherapists, experts (or Marcotte’s own Physiotherapists) may need to be hired to model the required exercises correctly. Since physiotherapy is a complex art form at a small scale, even the smallest errors in technique could be dangerous to the patient’s health, and should be avoided by hiring professionals or using existing Physiotherapists. This is the main area of concern regarding paid components for the system. The open source PayPal API to authenticate user payments is free to use, and therefore not a concern for budgeting. Payment authentication is an important feature that needs to operate flawlessly to maintain relationships with paying customers, and PayPal was sought to be the most efficient way to complete this feature after much deliberation.

## Interfaces

\*Northmore’s Part

### User Interfaces

The application will support two primary views which will depend on the permissions of the user. In short, there will be a Physiotherapist view and a Client view. These interfaces will be designed for usability as it needs to allow easy navigation and understandability. Lastly, there will be a tertiary Admin view solely for the administer of the system. This view allows extensive permissions and administration of the application.

### Hardware Interfaces

This application will require hardware interfaces. A server that is able to be accessed through HTTP requests is required. Experimental tests and modifications may be performed using port 8080 however by default the server will be listening on port 80, therefore our client-side port will be 80 by default. For security, the Secure-Socket Layer will be used also known as Transport Layer Security. IP addresses are unknown at this time. The server should also be running 24/7 without interruption.

### Software Interfaces

* For this application, we will be using an external JavaScript framework by the name of ember.js, as this requires a large amount of detail and many different user interactions. The use of this framework allows for complex user-interactions by managing the complexity of the web app. This is a third-party framework that is free and provides the described extension to JavaScript.
* Like many other projects, this will require a purchased component. Due to the need to continuously run the application, a web server that is always active must be purchased and used to host the final product as well as dealing with user traffic. For testing purposes a development server will be used however, the deployed product will contain this purchased component.
* Finally, a database will be required for this. Like many new systems, a new database will be used. This will possibly be filled with prior data from the previous software system Marcotte Physiotherapy had implemented. This component is an interface to view the records in an organized manor and will interact with the newly developed system. It is a newly created component.
* There is also a need for a payment interface to ensure secure transactions from client side. Such a task requires that a third-party interface exists, such as the Payment API made by PayPal. This is a “Rest API to easily and securely accept online and mobile payments”. It is a free third party application programming interface to provide needed functionality.
* Finally, an online interface for site testing will be used. The development team has chosen to use “Browsera.com” which allows for automated cross browser compatibility testing. In short, Self Start will be tested to ensure no errors occur when viewing in any browser. This is a free third party web application and is used as a testing tool.

### Communications Interfaces

There must be a communication interface to handle the exchange of information between the client machine and the server that is hosting the application (Unknown at this time). As discussed above, an HTTP server will be used along with Transport Layer Security (TLS) primarily on port 80. This will be directly connected to the internet server and will ensure the safe transmission of data.

## Licensing Requirements

The final iteration of the Self Start System will be the sole property of Loop Solutions Inc. The Self Start system will then be sold to Marcotte Physiotherapy for a one-time licensing fee agreed upon by both parties. The system is limited to the usage of licensed Physiotherapists of Marcotte Physiotherapy, but can be accessed by any potential Patient as well as existing patients to access treatment through a different user-interface.

## Legal, Copyright and Other Notices

All the information that the Patient discloses to the Physiotherapist during treatment regarding the circumstances pertaining to their injury is protected under the Physician-patient privilege related to the Patient’s medical confidentiality. By law, the Physician cannot disclose this information to anyone except the Patient, and as such any dynamic forms or information passed over the Self Start system must be encrypted. As well, the auxiliary information of the patient such as health card number, address, and any other information must only be available to that Patients Physiotherapists and not any third parties.

## Applicable Standards

To accompany this project, a set of applicable standards must be complied to. These standards consist of; legal standards, quality and regulatory standards and finally industry standards for usability, interoperability, and operating system compliance.

The first set of applicable standards require that the application takes extra care in dealing with patient records and information. The document states “Provide secure authentication system to protect the privacy of the patients and to guarantee the confidentiality of their data”. This creates the need to provide data protection for all users of the application. Measures will also be implemented to protect the database, ensuring that data is handled securely and without corruption.

There must also be a set of usability standards to ensure accessibility to those with visual impairment. These standards will conform with any current policies in effect at Marcotte Physiotherapy.

The last of standards is based on the following objective “Develop a Web-based application to be 24/7 available to the patients of Marcotte Physiotherapy Clinic and their physicians and administration stuff”. It will be assured that this application will run constantly with no issues. As well, it is necessary to deliver a product with multi-device compatibility across multiple browsers to ensure usability.