



**Department of Electrical,
Computer, & Biomedical Engineering**
Faculty of Engineering & Architectural Science

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Instructor:	Dr. Sadaf Mustafiz
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<i>Assignment/Lab Number:</i>	2
<i>Assignment/Lab Title:</i>	Project Phase 1 Report

<i>Submission Date:</i>	February 22, 2021
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<http://www.ryerson.ca/senate/current/pol60.pdf>

1. Team Information

Table 1: Team #2 Information

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2. Process Model

For the purposes of this project, we went with Waterfall process model [3]. The appeal was due to how the deliverables are easy to estimate at each stage and it is free of execution ambiguity. The preference was given to this model as it avoids the need to have continuous revisions to meet customer requirements. The rigid nature of this model allows for meeting division and management of tasks amongst group members. This allows us to meet the academic setting needs of this project and to collaborate virtually in a global pandemic.

3. Problem Statement

Amidst the global pandemic, isolation has brought an increased emphasis on mental health as people are limited to staying indoors and required to limit social interaction. According to a recent study done by CTV, about 16% of Canadians said their mental health is worse or somewhat worse. [1] Consequently, there is a need for accessible free mental health resources for those who need it. Our group's proposed solution is an online journal system for users to self assess and treat mental wellness. This is an alternative to seeing a therapist, which is expensive and can be unavailable to the average person.

4. Informal Requirement Description

This section of the informal requirements is a revised version since the last proposal submitted to the professor. It includes more specific information regarding the different use cases that we will include in our application.

The Sentiment web application serves as an online journaling system, a repository of mental self-help resources and a source to acquire the services of professional therapists. The journaling system will serve as a means to connect users to appropriate mental health resources. The sentiment app itself will provide a platform to connect users who need mental health support to qualified therapists who can provide one-on-one consultation.

Stats Canada research done in 2020 shows that regardless of age, gender, or ethnicity, there has been a statistical decline in mental wellness in comparison to past years [2]. Due to the

breadth of people that mental health impacts, the “Sentimint” app will target all users. Additionally, institutions such as schools or corporations can use the Sentiment app to better enable their Guidance Counselors or Human Resource (HR) department to intervene and assist their members. This is accomplished by allowing either students or employees to selectively share their journal entries for professional critique with a counselor or H.R. Manager.

To gain access to the mental health resources associated with the “Sentimint” app, a new user must register by providing a username, actual name, address and phone number. “Student” or “Employee” users are also required to submit their student or employee identification number. Institutions register by submitting an institution name, the name of an institution representative such as a H.R. Manager or Guidance counselor and a list of associated members. The list of associated members should include name and identification number. The specifics of institutions registration were not described in previous revisions of the requirement description; therefore, they are emphasized now.

Although the real name of the user is known by the database, it is only used to process an emergency mental health assistance request. In case of a mental health crisis, the sentiment app will provide instant referral to local paramedic service. This will act like a final resort suicide prevention service, where the instantiation of this service will be provided by an easy to access emergency button in the journaling section of the application. The implementation of the emergency assistance function has been refined in comparison to previous submissions of the informal requirements. This has been accomplished by having the app only offer emergency paramedic assistance instead of both paramedic assistance and a list of emergency toll-free hotline numbers to streamline the emergency feature of the app. Furthermore, contrasting previous versions of the app, the user is now required to provide contact information during the registration process to ensure the local paramedics can quickly intervene in an emergency situation. Otherwise, the only visible information is a username to preserve anonymity.

Once registered, a user can create a journal entry, where the user can write a short 250-word blurb about any personal issues they may have experienced throughout the day. After each journal entry, the user will be required to complete a sentiment selection, where the user selects the sentiment that best describes their current mental state. These possible sentiment selections include joy, trust, fear, surprise, sadness, disgust and anticipation. Based on this assessment, the app will provide the most appropriate mental health resources including both self-help articles, quote of the day and physical exercises routines. In comparison to previous revisions of the informal requirements, the number of sentiments a user can select has been increased to more selectively distribute self-help content. Additionally, users will be able to access their previous journal entries arranged chronologically by data.

Furthermore, if the users decide that the “mental self-help” suggestions are not sufficient, they can request the advice of professional therapists facilitated through the “Paid Services” section. Users can sift through and select an appropriate therapist with whom they can book one-on-one therapy sessions. Financial transactions will be initialized by the app before one-to-one therapy sessions and executed by a third-party e-commerce solution such as PayPal. Additionally, therapy session appointments between users and therapists will be facilitated through the app where users can create an appointment by selecting a therapist of their choice and specifying a date and time. Licensed therapists can advertise their services by contacting app administration and

seek approval to be listed in the “Paid Services” section. Therapist listings include a name, credentials, short summary of services and an hourly rate. The therapist registration process has been changed in comparison to previous revisions of the requirement description to require therapists to be explicitly approved. This revised registration process for therapist ensures the quality of therapist being listed on the “Sentimint” platform in comparison to the prior requirement description revisions where therapists could simply register and advertise their services.

5. Task 1: Use Case Model

Figure 1 shows the USE case diagram that has been created during requirement elicitation.

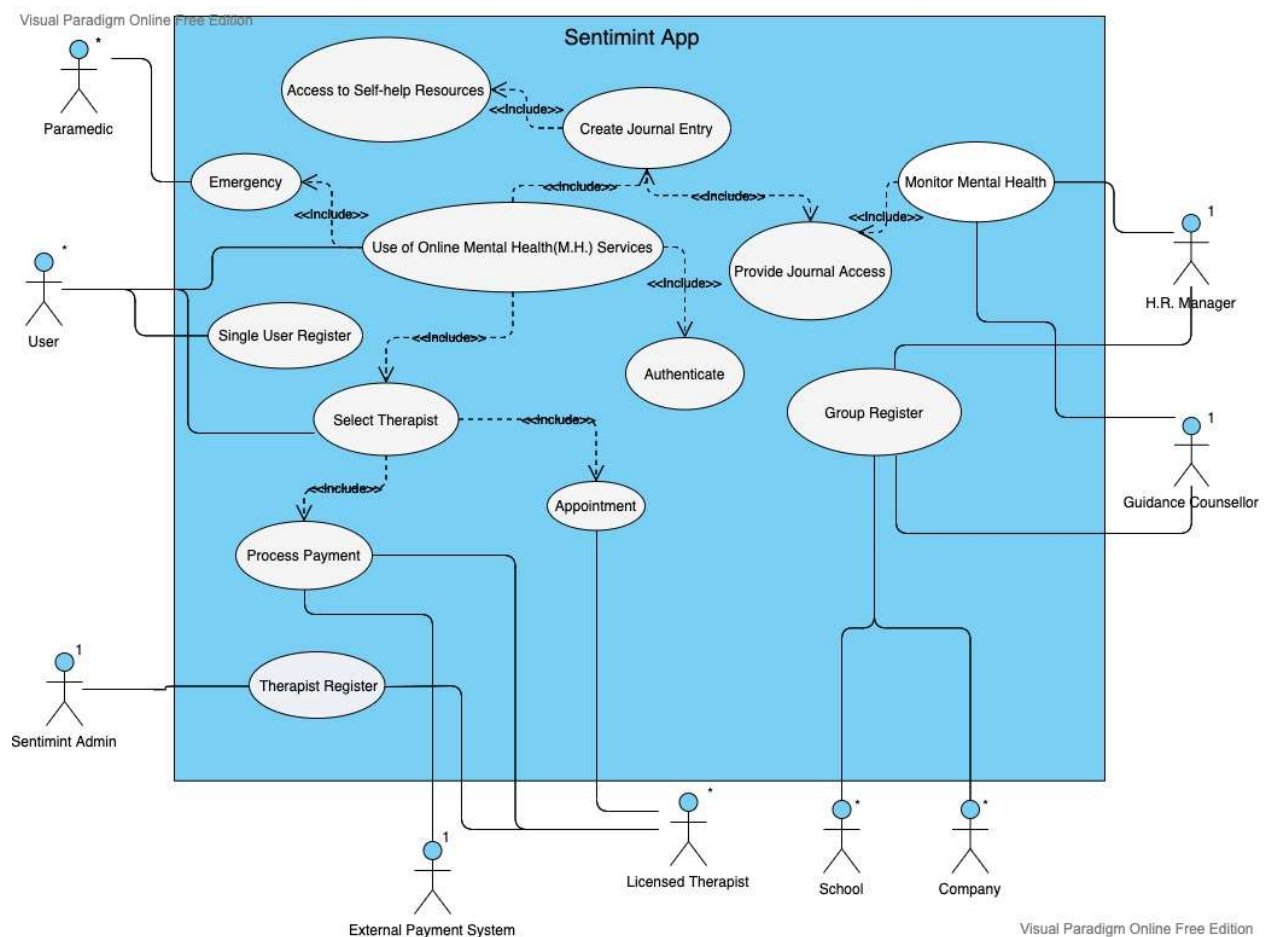


Figure 1: Sentimint Web-App Use Case Diagram

Use of Mental Health Services Use Case

Use Case: Use of Mental Health Services

Scope: Online Sentimint App

Level: Summary

Intention in Context: The intention is for mentally-troubled *Users* to find a place to vent their feelings and get professional help.

Multiplicity: Multiple *Users* from students, company employees can use the services of Sentimint. A given *User* can only have one active session with Sentimint.

Primary Actor: *User* (can be student or corporate employee as well)

Main Success Scenario:

1. *User* Authenticates with the *System*.
2. *System* provides Online Mental Health Services to *User*.
3. *User* Create Journal Entry.

Step 3 can be repeated as many times as the *User* deems necessary.

4. *User* informs the *System* to logout.
5. *System* informs the *User* of a successful logout.

Extensions:

2a. Authenticate is unsuccessful. Use case ends in failure

3||a. *User* stays idle for too long.

3||a.1 *System* informs the *User* that their session has expired due to their inactivity. Use case ends in failure.

3b. *User* chooses Select Therapist

3c. *User* chooses Emergency.

4a. *User* forgets to logout.

4a.1 *System* informs the *user* that their session has expired due to being idle for too long. Use case ends in failure.

Create Journal Entry Use Case

Use Case: Create Journal Entry

Scope: Online Sentimint App

Level: User-goal

Intention in Context: The intention is for *Users* suffering from mental illnesses to create journal entries.

Multiplicity: Multiple *Users* from students, company employees can use the services of Sentimint.

Primary Actor: *User* (can be student or corporate employee as well).

Main Success Scenario:

1. *User* requests to create a new Journal Entry from the *System* for a specific date.
2. The *System* then creates a new Journal Entry for the specified date to *User*.
3. *User* input their feelings into Journal Entry and select one of the following sentiment options including joy, trust, fear, surprise, sadness, disgust or anticipation.
4. Based on sentiment selection *System* recommends to *User* the most appropriate Access to Self Help Resources content.

Extensions:

3a. When *User* creates a new entry, he/she can specify whether they want to share their entry with the H.R. department from that company/institution.

Access to Self-help Resources Use Case

Use Case: Access to Self-help Resources

Scope: Online Sentimint App

Level: User-goal

Intention in Context: The intention is for *Users* suffering from mental illnesses to seek self-help resources.

Multiplicity: Multiple All Users including students and company employees can use the self-help service.

Primary Actor: User (can be student or corporate employee as well)

Main Success Scenario:

User accesses Use of Mental Health Services and selects create journal entry.

1. *System* gives user access to self-help resources that best match the sentiment of journal entry.

2. *User* selects the self-help resource(i.e. an article or quotes) they feel best suits their needs.
Step 2 is repeated as many times as needed by the user

Select Therapist Use Case

Use Case: Select therapist

Scope: Online Sentimint App

Level: Subfunction

Intention in Context: The intention is for the user to select a therapist.

Multiplicity: Only one *User* may talk to a *Therapist* at a given time.

Primary Actor: *System*

Secondary Actor: *Therapist, User* (can be student, corporate employee or hospital professional)

Main Success Scenario:

1. *User* Selects Therapist of their choice from Therapist List.
2. *User* selects the date and time they would like to meet the *Therapist* based on their availability.
3. *User* pays the required fees.
4. *System* Processes Payment via external payment Service.
5. *System* notifies *User* of successful payment.
6. *System* provides Appointment notice to the *User* and *Therapist*.

Extensions:

- 2a. The *Therapist* is not available at the time the *User* would like to meet.
- 2a.1. *User* reverts to step 1 and chooses another *Therapist*.
- 2a.2 Or *User* chooses another day.
- 4a. The *User* has entered the incorrect information, must re-enter correct information
- 5a. The *User* has insufficient funds, and is asked to provide another means to pay the amount
- 6.1. The *Therapist* is unable to meet due to incomplete transactions. Use case fails.

Appointment Use Case

Use Case: Appointment

Scope: Online Sentimint App

Level: Subfunction

Intention in Context: The intention is for the *User* to book an appointment with a *Therapist*.

Multiplicity: Only the user can have access to booking an appointment .

Primary Actor: *User* (can be student or corporate employee as well)

Secondary Actor: *Therapist*

Main Success Scenario:

User accesses Use of Mental Health Services from Sentimint App and selects Therapist.

1. *User* chooses to book an Appointment with a *Therapist*.
2. *System* list of times available for the *Therapist*.

Authenticate Use Case

Use Case: Authenticate

Scope: Online Sentimint App

Level: Subfunction

Intention in Context: The intention is for *Users* to authenticate in the Sentimint app.

Multiplicity: Multiple *Users* including students and company employees can use the services of Sentimint.

Primary Actor: *User* (can be student or corporate employee as well)

Main Success Scenario:

1. *User* provides username and password to the *System*.
2. The *System* then checks the username and password.
3. *System* notifies the *User* of a successful login.

Extensions:

- 2a. The *System* verifies whether the entered usernames and passwords are correct or incorrect.
- 2a.1. *System* suggests to the *User* to try again. Use case now reverts back to step 1.
- 2b. *System* verifies that the account is blocked.
- 2b.1 *System* notifies the *User* about the status of their account. The use case ends in failure.

Group Register Use Case

Use Case: Group Register

Scope: Online Sentimint App

Level: User Goal

Intent in Context: The intent of the *Company/School* is to register the name of the *School/Company*, the associated *Counselor/H.R. Manager* and a list of associated *Employees/Students* into the Sentiment App.

Multiplicity: Many *Companies/School* may register their *Employees/Students* concurrently.

Primary Actor: *Company/School*

Secondary Actor: *Counselor, H.R. Manager, Students, Employees*

Main Success Scenario:

Company/School accesses Online Sentiment web app from computer.

1. *System communicates with Company/School whether to Authenticate or register.*
2. *Company/School communicates with System to register.*
3. *System communicates with Company/School for Single User Register, Group Register or Therapist Register.*
4. *Company/School indicates Group Register.*
5. *System communicates with Company/School for name.*
6. *Company/School communicates with System and provides name.*
7. *System communicates with Company/School of successful name registration.*
8. *System communicates with Company/School for Counsellor/HRmanager.*
9. *Company/School communicates with System and provides name and identification number for Counsellor/HRmanager.*
10. *System informs Company/School of successful Counsellor/HRmanager registration.*
11. *System communicates with Company/School for Student/Employee name and identification number.*
12. *Company/School communicates with System and provides single Student/Employee member name and identification number.*
13. *System informs Company/School of successful Student/Employee registration.*
14. *Repeat Step 11-13 until all members associated with Company or School are communicated with system.*
15. *Company/School communicates with System that Group Register of Student/Employee is complete.*
16. *System communicates with Company/School and acknowledges completion.*
17. *System exits Group Register.*

Extensions:

7a. *System asserts to Company/School that Company/School name is missing, or name is already registered. Use case ends in failure.*

10a. *System asserts to Company/School that Counsellor/HRmanager name or/and identification number is missing or already registered. Use case ends in failure.*

13a. *System asserts to Company/School that Student/Employee name or/and identification number is missing or already registered. Use case ends in failure.*

Single User Register Use Case

Use case: Register Single User

Scope: Online Sentimint App

Level: User goal

Intention in Context: The intention of the *User* is to register with the Sentiment App.

Primary Actor: *User* (can be student, corporate employee or hospital professional)

Multiplicity: Many *Users* may register concurrently.

User accesses Online Sentiment web app from computer.

1. *System* communicates with *User* whether to Authenticate or register
2. *User* communicates with *System* to register.
3. *System* communicates with *User* for Single User Register, Group Register or Therapist Register.
4. *User* indicates Single User Register.
5. *System* communicates with *User* for name.
6. *User* communicates with *System* and provides name.
7. *System* communicates with *User* of successful name registration.
8. *System* communicates with *User* for phone number and location.
9. *User* communicates with *System* and provides phone number and location.
10. *System* communicates with *User* of successful phone number and location.
11. *System* communicates with *User* and acknowledges completion.
12. *System* exits Single User Register.

Extension:

7a. *System* asserts to *User* that name is missing, or name is already registered. Use case ends in failure.

8a. *System* asserts to *User* that phone number or/and location is missing or already registered. Use case ends in failure.

Therapist Register Use Case

Use Case: Therapist Register

Scope: Online Sentimint App

Level: User goal

Intention in Context: The intention of the *Therapist* is to advertise their services on the Online Sentiment App

Primary Actor: *Therapist*

Secondary Actor: *Sentimint Admin*

Multiplicity: Many *Therapists* may register concurrently

Main Success Scenario:

Therapist accesses Online Sentiment web app from computer.

1. *System* communicates with *Therapist* whether to Authenticate or register
2. *Therapist* communicates with *System* to register.
3. *System* communicates with *User* for Single User Register, Group Register or Therapist Register
4. *Therapist* indicates Therapist Register.

5. *System* communicates with *Therapist* for name, credentials, contact information and summary of services.
6. *Therapist* communicates to *System* name, credentials, contact information and summary of services.
7. *System* communicates successful input of information.
8. *System* prompts *Therapist* for 24 hour review period and exits Therapist Register.
9. *System* forwards *Therapist* name, credentials, contact information and summary of services to *Sentimint Administration* for review.
10. *Sentimint Administration* approves *Therapist* and posts *Therapist* contact under Select Therapist.

Extension:

- 7a. *System* asserts to *Therapist* missing name, credentials, contact information and/or summary of services. Use case ends in failure.
- 9a. *Sentimint Administration* does not approve *Therapist*. Use case ends in failure.

Process Payment Use Case

Use Case: Process Payment

Scope: Online Sentimint App

Level: Subfunction

Intention in Context: The *System* needs to process payment for a diagnosis to occur

Multiplicity: Multiple payments might be processed concurrently.

Primary Actor: *System*

Secondary Actor: *User* (can be student or corporate employee well), *Therapist*, *External Payment System*

Main Success Scenario:

1. *System* notifies the *External Payment System* of the amount due.
2. *External Payment System* notifies the *System* that the full amount has been paid.

Extensions:

2a. *External Payment System* notifies *System* that external payment for the *Therapist* was not completed successfully in its entirety, and about the remaining amount due.

2a.1 *User* has not identified himself as an employee/student.

2a.1a. *System* requests identification of *User*.

2a.1.2a. *User* request *System* to cancel the transaction. The allocated Appointment given to the *User* is removed from the *Therapists* schedule.

Receive Payment Use Case

Use Case: Receive Payment

Scope: Online Sentimint App

Level: User Goal

Intention in Context:

The Therapist receives payment for the scheduled therapy session/diagnosis.

Provide Journal Access Use Case

Use Case: Provide Access

Scope: Online Sentimint App

Level: Subfunction

Intention in Context: The intention is for the *User* to provide access to their journal entries to the *H.R. Manager* or the *Guidance Counsellor*.

Multiplicity: Many users may provide their journal entry access to the *H.R. Manager* or the *Guidance Counsellor*.

Primary Actor: *User* (can be student, corporate employee or hospital professional), Therapist

Main Success Scenario:

1. *User* selects Create Journal Entry.
2. *User* selects Provide Journal Access for the *H.R. Manager/Guidance Counsellor* to view the journal.
3. *System* generates an encryption key.
4. *User* provides the encryption key to *H.R. Manager/Guidance Counsellor* offline.

Monitor Mental Health Use Case

Use Case: Monitor Mental Health

Scope: Online Sentimint App

Level: User-goal

Intention in Context: The intention is for the *H.R. Manager* or the *Guidance Counsellor* to review the mental health status of an *Employee* or a *Student* (if authorized by the user).

Multiplicity: One *H.R. Manager* or the *Guidance Counsellor* can view the *User's* journal entry at a time.

Primary Actor: *H.R. Manager/Guidance Counsellor*

Main Success Scenario:

H.R. Manager/Guidance Counsellor accesses *Sentiment* web app from computer.

1. *H.R. Manager/Guidance Counsellor* selects the Provide Journal Access.

2. *H.R. Manager/Guidance Counsellor* enters the user's identification along with the encrypted key.
3. *System* redirects *H.R. Manager/Guidance Counsellor* to the journal page of the specified account.
4. *H.R. Manager/Guidance Counsellor* is able to view only the list of journal entries of the *User*.

Extensions:

2a. The *H.R. Manager/Guidance Counsellor* enters the incorrect encryption key or the credential.

2a.1. *H.R. Manager/Guidance Counsellor* reverts to step 5 and re-enters the credential along with the encrypted key.

Emergency Use Case

Use Case: Emergency

Scope: Online Sentimint App

Level: User-goal

Intention in Context: The intention is for the User to contact emergency services.

Multiplicity: Only the user can have access to the emergency number.

Primary Actor: *User* (can be student, corporate employee or hospital professional)

Secondary Actor: Paramedic

Main Success Scenario:

User accesses Use of Mental Health Services from Sentimint App.

1. *User* selects Emergency.
2. *System* provides contact to *Paramedic*.

6. Task 2: Domain Model

See Figure 2 for Domain model derived from the Use case model (Figure 1) and Project requirements.

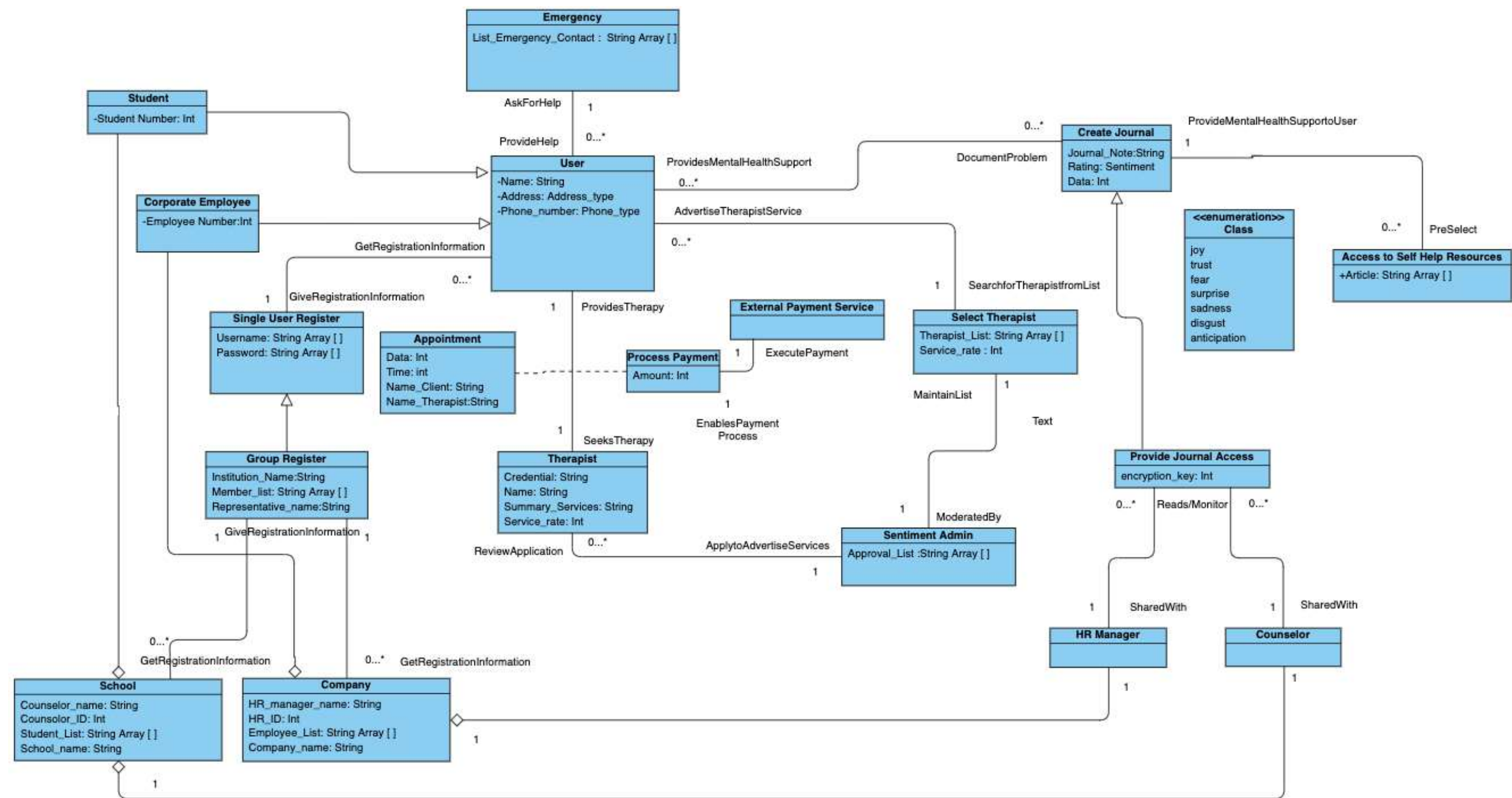


Figure 2: Sentiment Web-App Domain Model

7. Task 3: User Interface

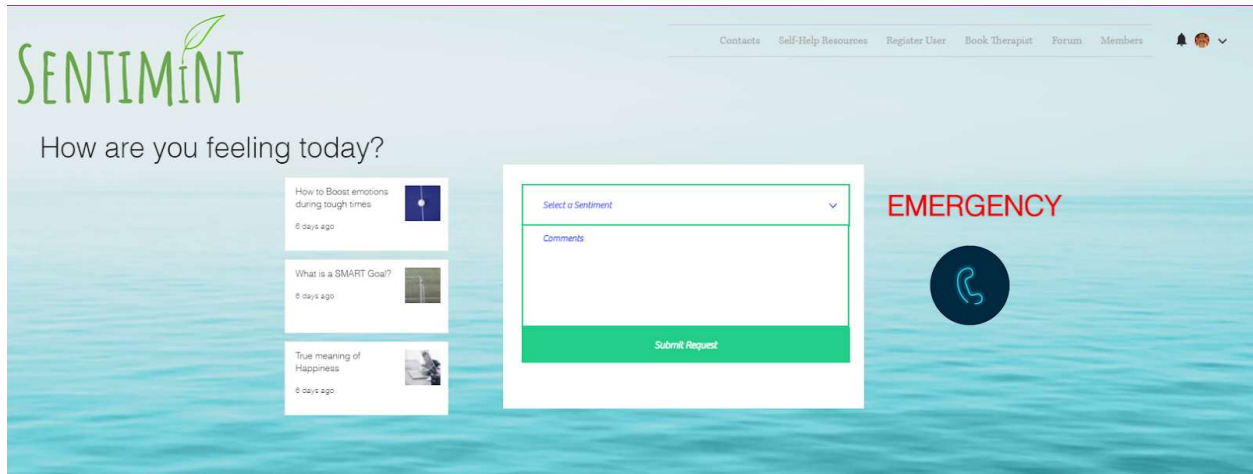


Figure 3: Home Page

This is the Home page (landing page) as soon as the user logs in using their credentials.

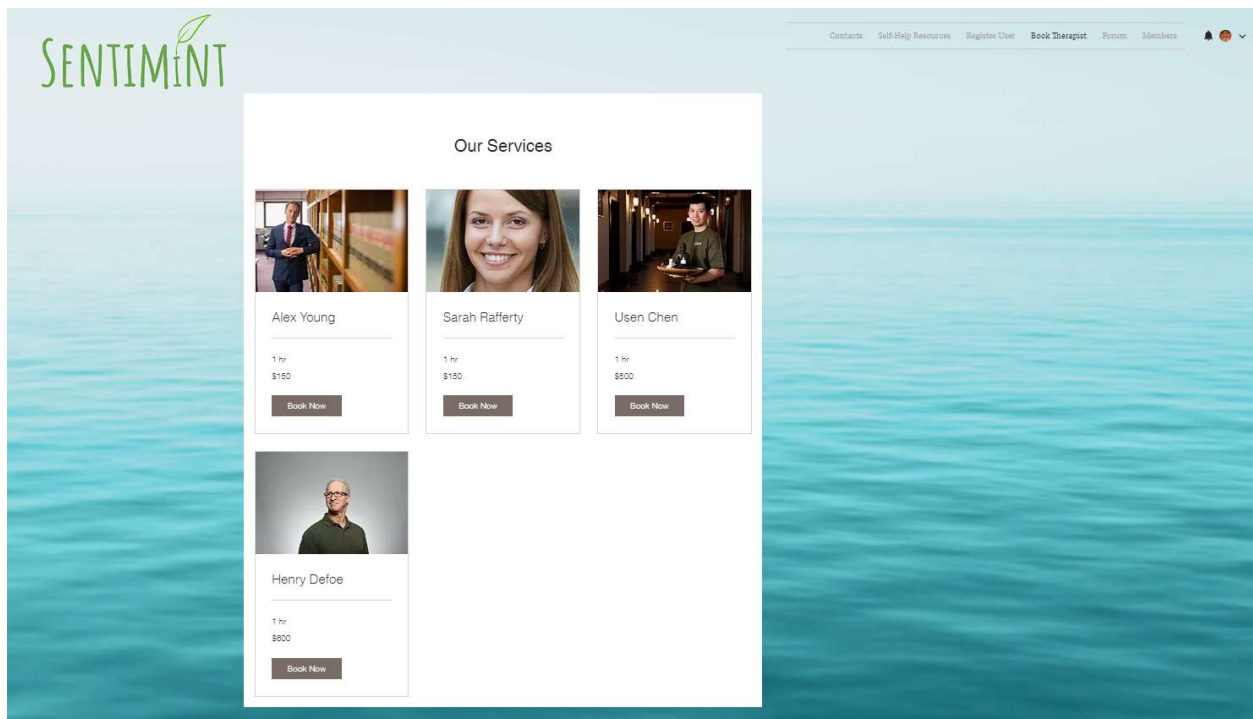


Figure 4: Book Therapist Tab

On this page users will be able to select from a list of therapists to choose from to consult their issues.

Schedule Online

Feb. 21 - 27, 2021



Today

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
21	22	23	24	25	26	27

Monthly view

Morning	Afternoon	Evening
10:00 am	12:00 pm	5:00 pm
10:30 am	12:30 pm	
11:00 am	1:00 pm	
11:30 am	1:30 pm	
	2:00 pm	
	2:30 pm	
	3:00 pm	
	3:30 pm	
	4:00 pm	
	4:30 pm	

Alex Young

1 hr | \$150

February 26, 2021

Business Address

Next

Figure 5: Appointment tab

On this page, Users will be able to choose from a list of dates and times to meet therapist they selected previously

[< Back](#)

Add Your Info

Tell us a bit about yourself

Name *

User User

Email *

user@ryerson.ca

Phone Number

416 967 1111

Add Your Message

Add a note...

* Required Info

Alex Young

1 hr | \$150

February 26, 2021 12:00 pm

Business Address

Pay Now

Figure 6: Appointment tab continued

Here users will be able to enter further information regarding their appointment.

Great, You're Booked!

A confirmation email is on its way to you.

26

February

Fri 12:00 pm

Alex Young

Staff Member #1

1 hr | \$150

Business Address

Add to My Google Calendar

[Check out more services](#)

Figure 7: Appointment Confirmation

Once the payment for the therapist has been successfully received, a confirmation notice will be sent to both the user and therapist informing them of the appointment.

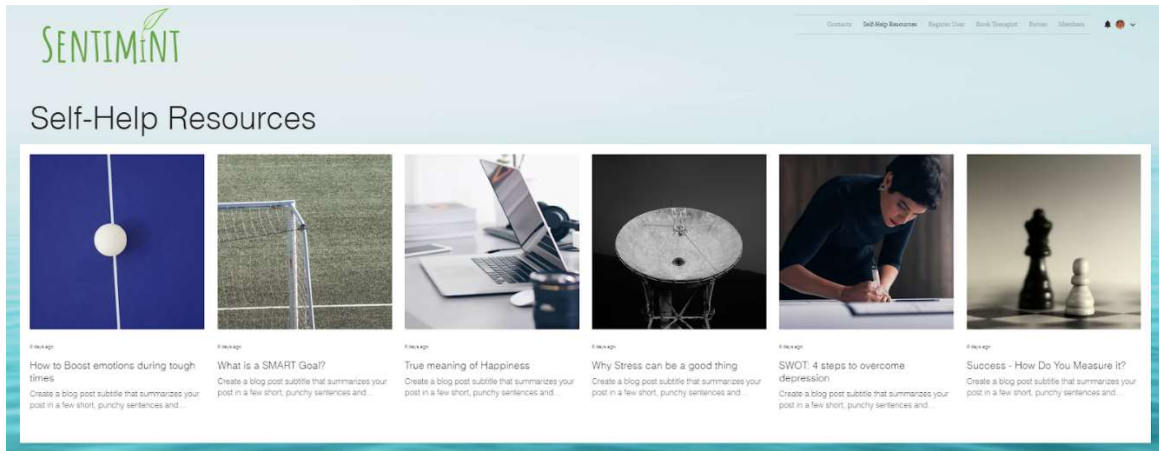


Figure 8: Self Help Resources Tab

With the self-help resources tab users will be able access different material including articles and quotes of the day, based on the sentiment they have selected in the enter journal tab.

Register User

First Name

Last Name

Address *

Phone Number

Username *

Password*

Group Register

First Name & Last Name

Address

Phone Number

Username *

Password*

Institution Name

Representative Name

Provide Journal Access (YES or NO)

Therapist Register

First Name & Last Name

Address

Phone Number

Username *

Password*

Institution Name

(a)
(b)
(c)

Figure 9: (a) Single Register User, (b) Group Register & (c) Therapist Register

In the above tabs, a user, student/employee, or a therapist will be able to register themselves in order to gain access to the app.

8. Task 4: Project Plan Model (Waterfall):

Breakdown of phases and activities/tasks:

1. Proposal:
 - I. Requirements Definition:
 - i. Proposal Submission
2. Phase 1:
 - II. System and Software Design:
 - i. Use Case Model
 - ii. Domain Model
 - iii. User Interface Design
 - iv. Project Plan
 - v. Requirements Document (Report)
 - vi. Presentation
3. Phase 2:
 - III. Implementation & Unit Testing:
 - i. Back-end development: SQL, Node.js and MongoDB
 1. Design & Setup a database
 - a. Determine database parameters (domain model): First/Last Name, email, address, phone number, company name, student/employee ID, journal entries
 2. Setup a Node server
 3. Integrate Node server with database
 - ii. Front-end developer (UI/UX): HTML, CSS, and JavaScript
 1. Create homepage/login page/registration/self-help resources page/journal entry page/therapist page
 - iii. Integrate front-end with back-end
 - iv. Design Document
 - IV. Integration & System Testing (customer delivery):
 - i. Quality Assurance Testing:
 - ii. App Deployment
 - V. Operation & Maintenance (correcting errors):
 - i. Intermediate Project Review (lab)
 - ii. Presentations/Demos (in-class)
 - iii. Final Report/Demo

Milestones:

Table 2: Milestones for Sentimint Web-App Development

Milestone Number	Milestone Description
1.1	Use Case Model
1.2	Domain Model
1.3	User Interface Design
1.4	Project Plan
2.1	Registration/Login Page
2.2	Layout Views
2.3	User Authentication
2.4	Final UI Style
2.5	Unit Testing
2.6	Integration Test Flows
2.7	Sentimint App Deployment

Activity Graph:

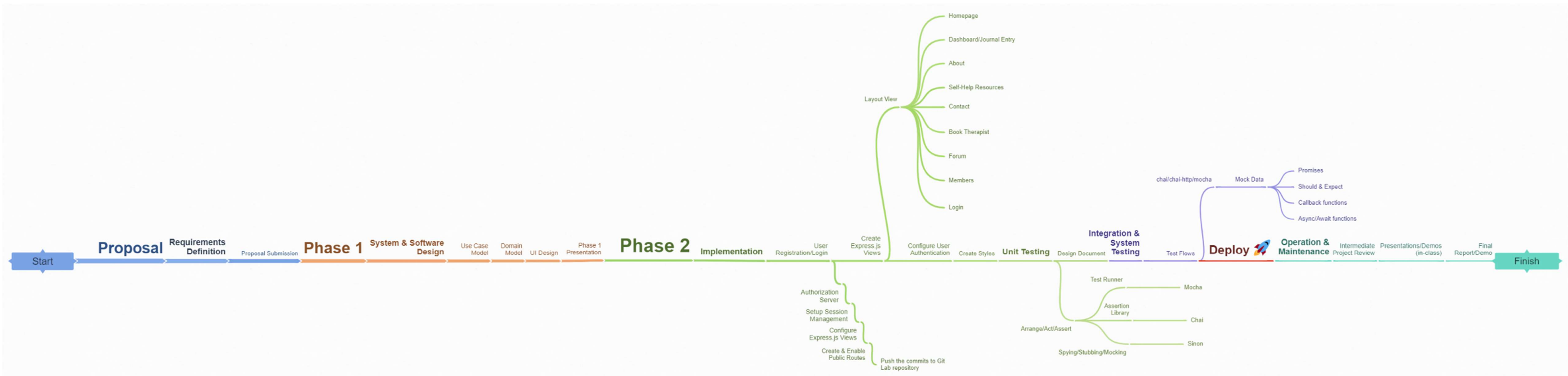


Figure 10: Sentimint Web-App Activity Graph

Time estimates per task:

Table 3: Time Estimates per Milestone Task for Sentimint Web-App Development

Milestone Number	Milestone Description	Time Estimate (in days)
1.1	Use Case Model	11
1.2	Domain Model	5
1.3	User Interface Design	4
1.4	Project Plan	2
2.1	Registration/Login Page	3
2.2	Layout Views	7
2.3	User Authentication	2
2.4	Final UI Style	2
2.5	Unit Testing	7
2.6	Integration Test Flows	7
2.7	Sentimint App Deployment	7

Slack times:

Table 4: Slack Times for Sentimint Web-App Development

Milestone Number	Earliest Start Time	Latest Start Time	Slack
1.1	1	1	0
1.2	6	6	0
1.3	7	7	0
1.4	9	9	0
2.1	11	14	3
2.2	17	18	1
2.3	24	26	2
2.4	26	26	0
2.5	28	30	2
2.6	35	35	0
2.7	42	42	0
Finish	68	68	0

Critical path(s):

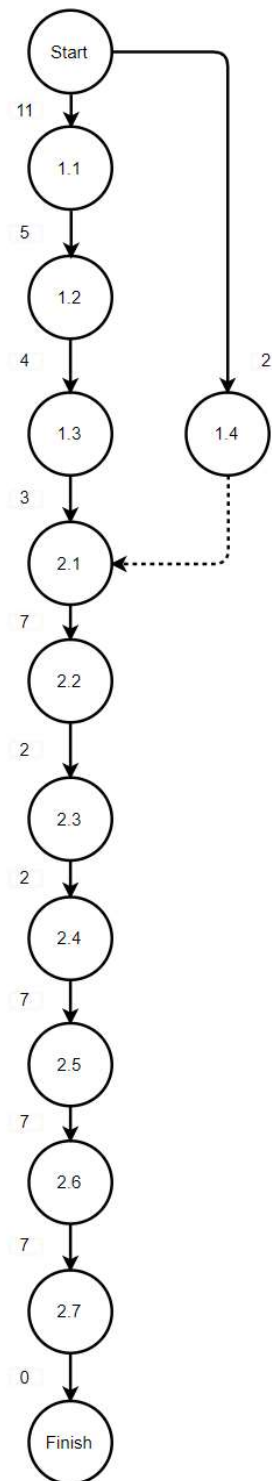


Figure 11: Sentimint Web-App Critical Path

Gantt chart:

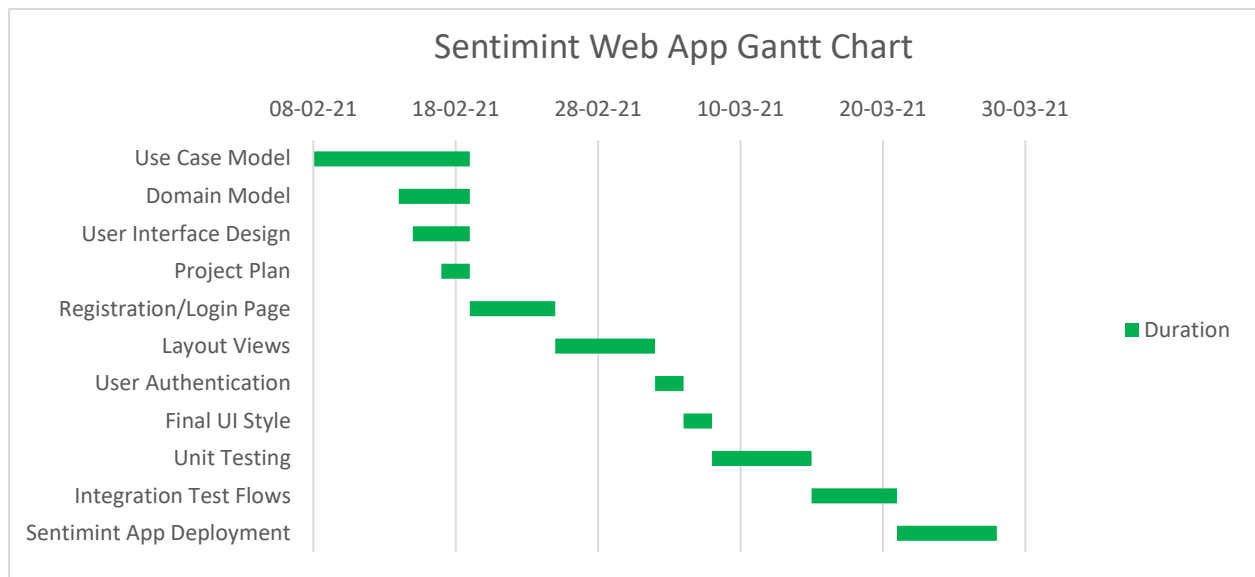


Figure 12: Sentimint Web-App Gantt Chart

9. References

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