



Software Requirements Specification

for

SafeSpace Chatbot

Version 1

Prepared by Group 21

Syracuse University CSE 687

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1. Introduction

1.1. Purpose

This SRS aims to define the software requirements for the development of a mental health assessment chatbot. It serves as a guiding document for implementing the necessary functionality. The chatbot is intended to offer accessible and immediate mental health support by engaging users in conversational assessments, providing preliminary mental health scores, and guiding them towards appropriate resources based on assessment outcomes and geographical location. By creating a user-friendly and secure platform, the chatbot aims to break down barriers to mental health care and promote a more inclusive and supportive healthcare environment.

1.2. Scope

This project aims to develop a mental health assessment chatbot with the following capabilities:

1. Conducting conversational assessments to evaluate users' mental health status.
 2. Providing preliminary mental health scores based on the assessments.
 3. Guiding users towards appropriate mental health resources and professionals based on assessment outcomes and geographical location.
 4. Ensuring user privacy, data security, and information accuracy.
 5. Creating a user-friendly interface to facilitate easy interaction and engagement.
- Overall, the project focuses on leveraging technology to offer accessible and immediate mental health support, breaking down barriers to care, and promoting a more inclusive and supportive healthcare environment.

1.3. Definition

BDD	Block Definition Diagram
SRS	System Requirements Specification
UML	Unified Modeling Language

1.4. References

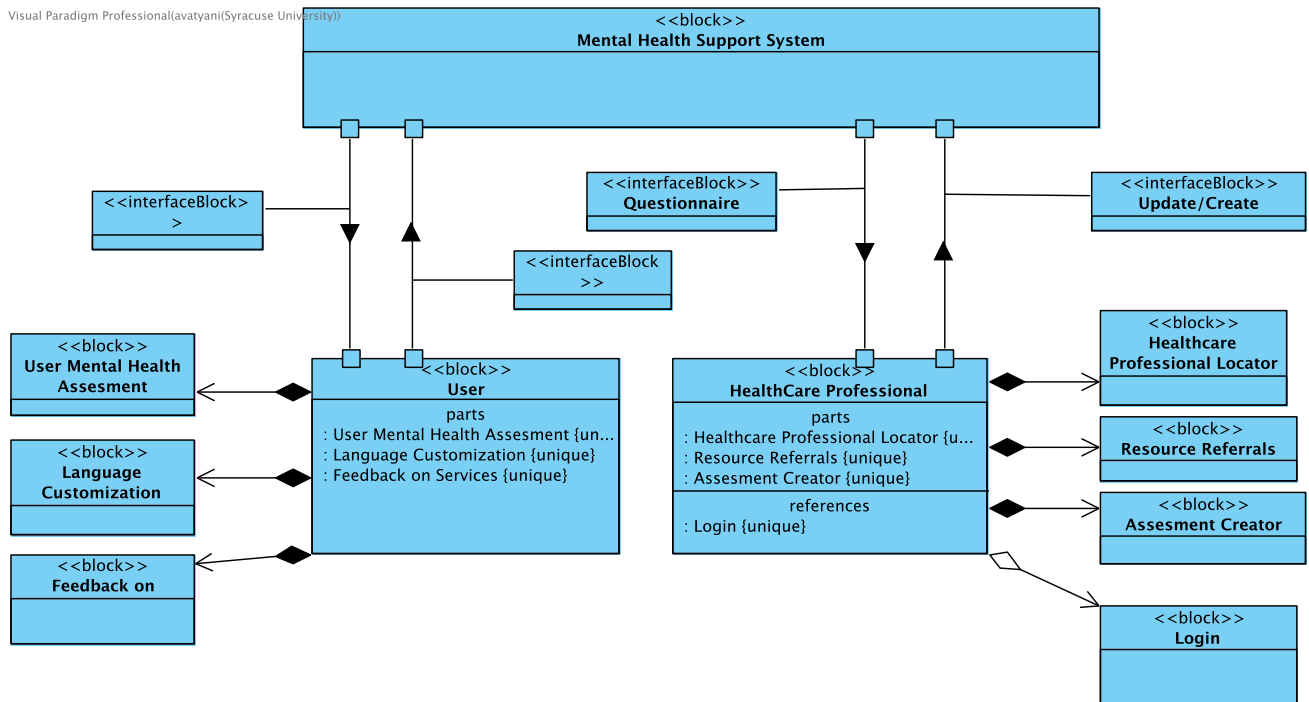
IEEE Std 830-1998 - IEEE Recommended Practice for Software Requirements Specifications - Revision of IEEE Std 830-1993

2. Overall Description

2.1. Product Perspective

This chatbot product is designed to offer immediate mental health support and resources to users. The primary purpose of this product is to conduct conversational assessments to evaluate users' mental health status and provide preliminary mental health scores. Additionally, it aims to guide users towards appropriate mental health resources and professionals based on assessment outcomes and geographical location. A secondary purpose of the product is to ensure user privacy, data security, and information accuracy. The product will rely on databases of mental health resources and professionals. The interface will be user-friendly, facilitating easy interaction and engagement for individuals seeking mental health support.

2.1.1. BDD_Architecture



Mental Health Support System

The central unit of the system which coordinates the flow of information between users and healthcare professionals.

User

The user interacts with the chatbot and based on the user's responses, our chatbot will ask follow-up questions to assess the user's mental health.

HealthCare Professional

The role within the system responsible for reviewing assessments, providing resources, and creating new assessment tools.

Assesment Creator

A tool used by healthcare professionals to create and manage mental health assessment tools.

Feedback on Services

A module for users to provide feedback about the services they received, which can be used for system improvement.

Healthcare Professional Locator

A tool for users to find healthcare professionals based on their needs and preferences.

Language Customization

Feature that enables users to select or change the language in which they interact with the system.

Login

The entry point for healthcare professionals to access the system, requiring authentication for use.

Resource Referrals

A system component that provides users with information and referrals to additional mental health resources.

User Mental Health Assessment

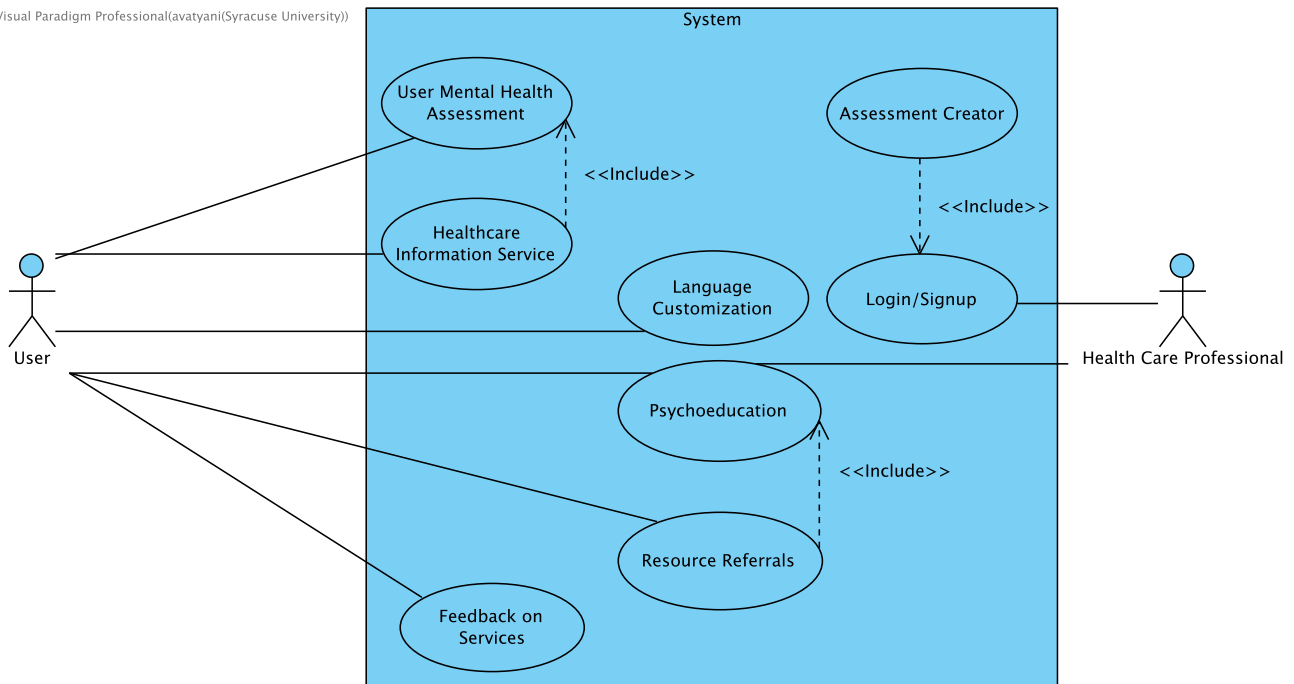
A tool that allows users to assess their mental health status by answering a series of questions.

2.2. Product Functions

The following use case diagram depicts how the users/patients and healthcare professionals will interact with the SafeSpace chatbot.

2.2.1. Use Case Diagram Architecture

Visual Paradigm Professional(avatyani(Syracuse University))



2.3. Use Case Descriptions

2.3.1. User

ID: AC01

The user represents individuals who interact with the mental health chatbot to assess their mental well-being, seek resources, and receive support.

2.3.2. Healthcare Information Service

ID: UC05

After completing a mental health assessment, the chatbot can guide users to locate healthcare professionals.

Primary Actors

User

Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A

Preconditions	User has completed an assessment or has specific preferences for a healthcare professional.
Post-conditions	User is provided with information to contact a healthcare professional.
Author	N/A
Assumptions	N/A

Scenarios

Scenario

1. User requests to find a healthcare professional.
2. Chatbot asks for necessary details (e.g., location, preferences).
3. Chatbot searches its database, or third-party APIs and presents options.
4. User selects a professional and receives contact information.

Requirements

 Data privacy, up-to-date information

ID: UC05.REQ002













Acquiring user information solely for the purpose of retrieving nearby healthcare professional details based on their location. Additionally, maintaining accurate and up-to date records of healthcare professionals within our database.

 Database of healthcare professionals, third-party data API, search and filtering algorithm

ID: UC05.REQ001

It maintains a comprehensive database of healthcare professionals integrating third-party data APIs for data enrichment, implementing a robust search and filtering algorithm to facilitate user navigation.

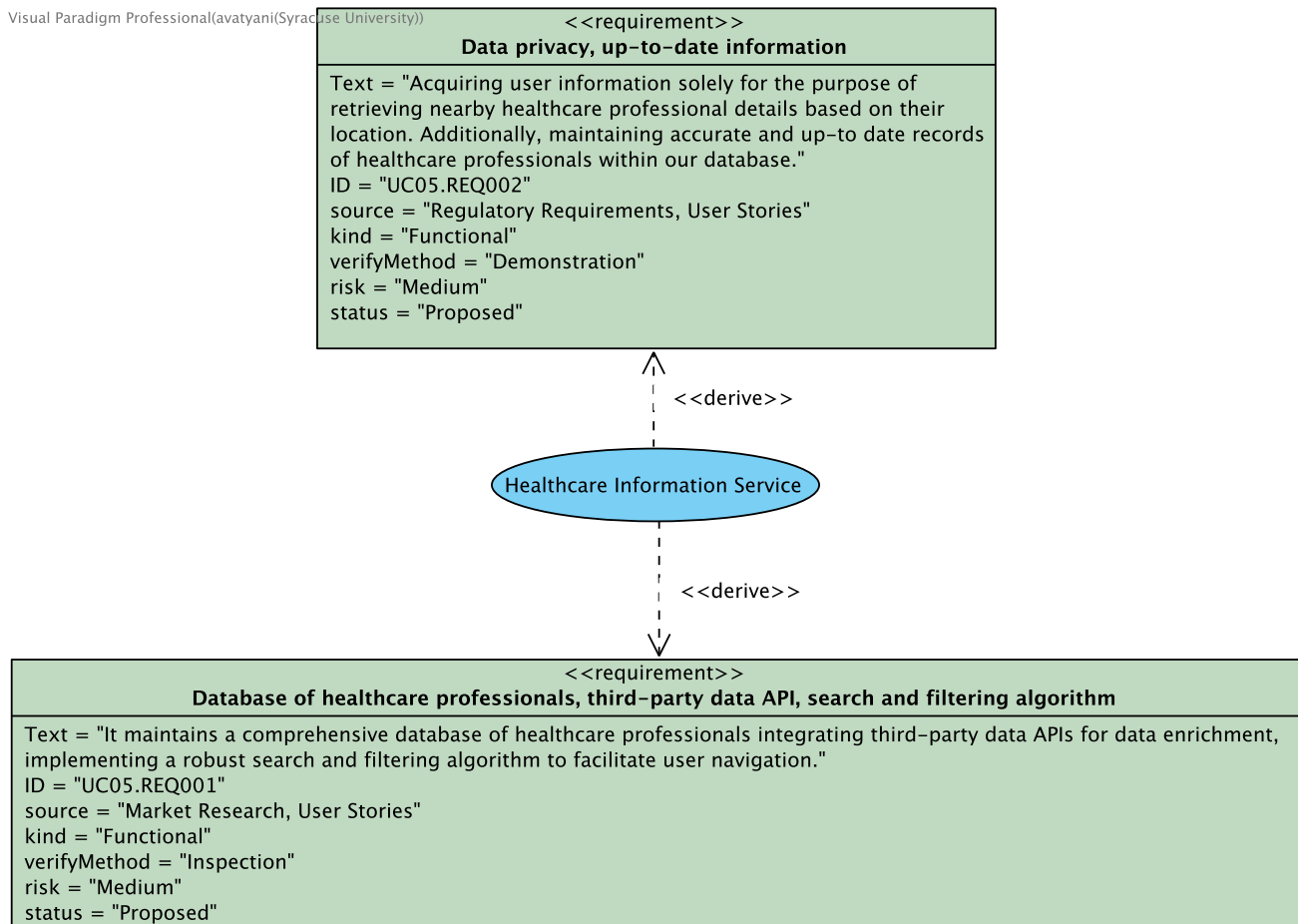
Relationships

Relationship	From	To
 unnamed	 Healthcare Information Service	 Data privacy, up-to-date information
 unnamed	 Healthcare Information Service	 Database of healthcare professionals, third-party data API, search and filtering algorithm
 unnamed	 Healthcare Information Service	 User Mental Health Assessment
 unnamed	 User	 Healthcare Information Service

Sub Diagrams

Health Professional Locator Requirement Diagram

Visual Paradigm Professional(avatyani(Syracuse University))



2.3.3. Language Customization

ID: UC06

Users can customize the language of the chatbot's interface and dialogue for the assessment.

Primary Actors

User

Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	The chatbot is programmed to support multiple languages.
Post-conditions	All chatbot communications proceed in the user's selected language.
Author	N/A
Assumptions	N/A

Scenarios

Scenario

1. User expresses a desire to change language.
2. Chatbot displays available language options.
3. User selects a language.
4. Chatbot confirms and switches all interactions to the selected language.

Requirements

 Language options within the chatbot, dynamic language switching.

ID: UC06.REQ001





This requirement involves offering multiple language options in the chatbot interface and enable dynamic language switching for users to seamlessly switch between languages during interaction.

 Seamless User Experience

ID: UC06.REQ002

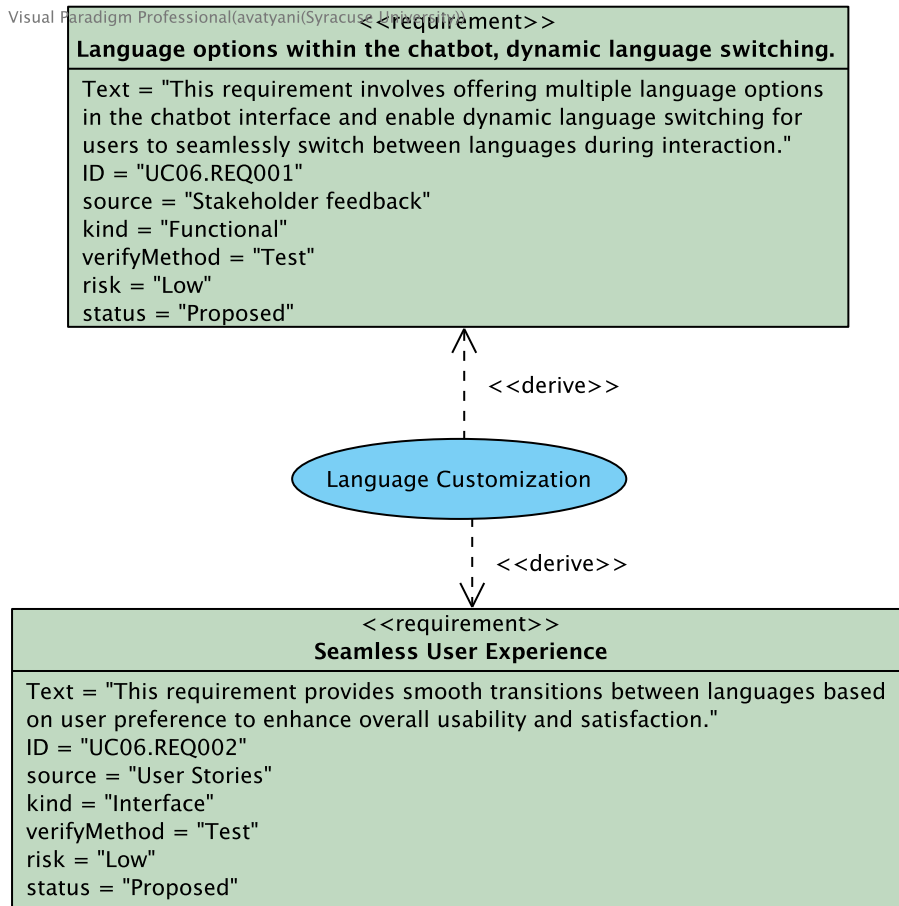
This requirement provides smooth transitions between languages based on user preference to enhance overall usability and satisfaction.

Relationships

Relationship	From	To
 unnamed	 Language Customization	 Language options within the chatbot, dynamic language switching.
 unnamed	 Language Customization	 Seamless User Experience
 unnamed	 User	 Language Customization

Sub Diagrams

Language Customization Requirement Diagram



2.3.4. Feedback on Services

ID: UC07

This use case allows users to provide feedback directly to the chatbot about their experience using the service.

Primary Actors

👤 User

Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	User has interacted with the chatbot and has feedback to provide.
Post-conditions	Feedback is recorded for analysis by system developers.
Author	N/A
Assumptions	N/A

Scenarios

Scenario

1. User is prompted for or requests to give feedback.
2. Chatbot presents a structured format for feedback.
3. User inputs their feedback into the chat.
4. Chatbot acknowledges receipt of feedback.

Requirements

 Feedback collection interface, data storage for feedback.

ID: UC07.REQ001










The need involves developing an interface for collecting feedback on services, as well as implementing a data storage system to store this feedback.

 User anonymity options

ID: UC07.REQ002

This maintains users' anonymity when providing feedback on services to ensure their identity remains confidential when submitting their opinion.

Relationships

Relationship	From	To
 unnamed	 Feedback on Services	 Feedback collection interface, data storage for feedback.
 unnamed	 Feedback on Services	 User anonymity options
 unnamed	 User	 Feedback on Services

Sub Diagrams

Visual Paradigm Professional (anydesk(57.9.0.0) and Internet))

<<requirement>>

Feedback collection interface, data storage for feedback.

Text = "The need involves developing an interface for collecting feedback on services, as well as implementing a data storage system to store this feedback. "

ID = "UC07.REQ001"

source = "Market Survey"

kind = "Functional"

verifyMethod = "Analysis"

risk = "Low"

status = "Proposed"

<<derive>>

Feedback on Services

<<derive>>

<<requirement>>

User anonymity options

Text = "This maintains users' anonymity when providing feedback on services to ensure their identity remains confidential when submitting their opinion."

ID = "UC07.REQ002"

source = "Regulatory requirements"

kind = "Interface"

verifyMethod = "Inspection"

risk = "High"

status = "Proposed"

```
graph TD; R1["<<requirement>>  
Feedback collection interface, data storage for feedback.  
Text = \"The need involves developing an interface for collecting feedback on services, as well as implementing a data storage system to store this feedback. \"  
ID = \"UC07.REQ001\"  
source = \"Market Survey\"  
kind = \"Functional\"  
verifyMethod = \"Analysis\"  
risk = \"Low\"  
status = \"Proposed\""] -- "<<derive>>" --> UC1(["Feedback on Services"]); UC1 -- "<<derive>>" --> R2["<<requirement>>  
User anonymity options  
Text = \"This maintains users' anonymity when providing feedback on services to ensure their identity remains confidential when submitting their opinion.\"  
ID = \"UC07.REQ002\"  
source = \"Regulatory requirements\"  
kind = \"Interface\"  
verifyMethod = \"Inspection\"  
risk = \"High\"  
status = \"Proposed\""];
```

ID: UC09

Primary Actors

👤 Health Care Professional, 👤 User

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	<p>The chatbot system is operational and accessible to users.</p> <p>Users have initiated a session with the chatbot.</p> <p>Healthcare professionals have reviewed and approved psychoeducational resources for dissemination.</p>
Post-conditions	<p>Users have access to accurate and verified psychoeducational resources through the chatbot.</p>

Users have received relevant information about different mental health conditions, treatment options, and self-care strategies.

Author	N/A
Assumptions	N/A

Scenarios

Scenario

1. User selects the psychoeducation option in the system.
2. User browses through the educational materials.
3. User chooses a topic and engages with the content.

Requirements

Content Approval Mechanism

ID: UC09.REQ001

Implement a system where all psychoeducational resources provided by the chatbot undergo a rigorous approval process by healthcare professionals before being made available to users.

Resource Accessibility

ID: UC09.REQ003



















Ensure that psychoeducational resources provided by the chatbot are accessible to users with diverse needs.

Resource Authentication

ID: UC09.REQ002

Ensure that each psychoeducational resource provided by the chatbot is authenticated and verified by healthcare professionals to guarantee its accuracy and reliability.

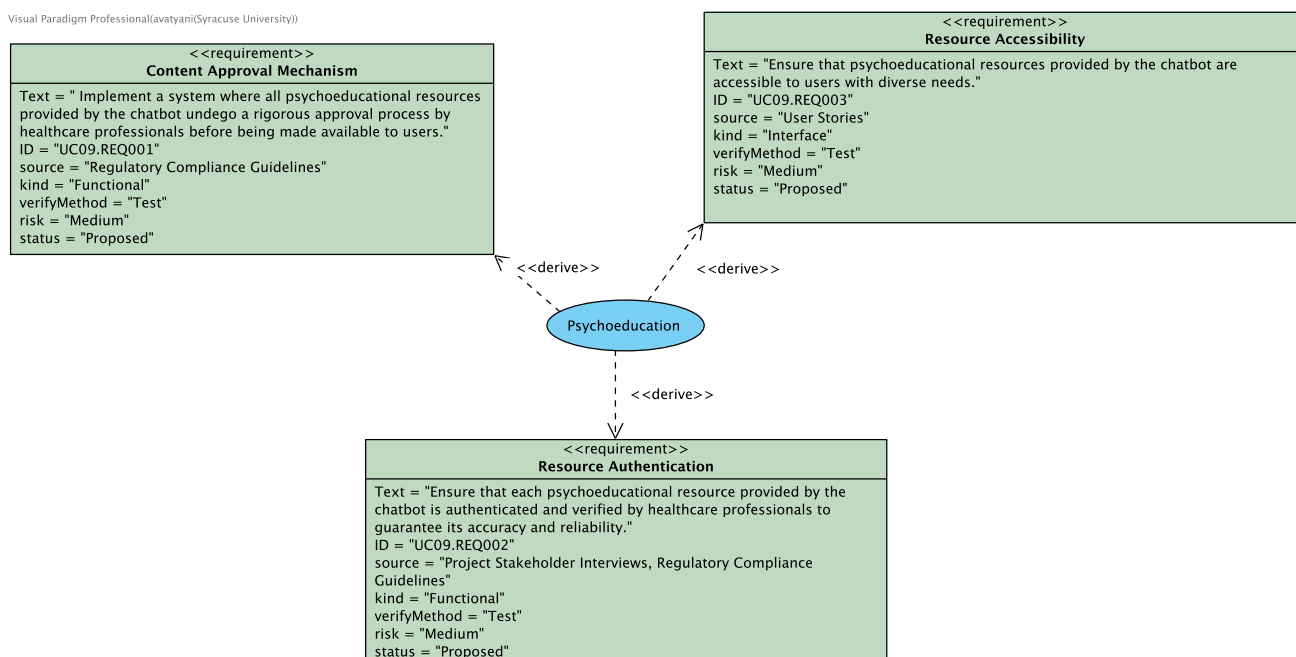
Relationships

Relationship	From	To
 unnamed	 Psychoeducation	 Resource Accessibility
 unnamed	 Psychoeducation	 Content Approval Mechanism
 unnamed	 Psychoeducation	 Resource Authentication
 unnamed	 Resource Referrals	 Psychoeducation
 unnamed	 Health Care Professional	 Psychoeducation
 unnamed	 User	 Psychoeducation

Sub Diagrams

Psychoeducation Requirement Diagram

Visual Paradigm Professional(avatyani(Syracuse University))



2.3.6. Health Care Professional

ID: AC02

The healthcare professional serves as the creator of the mental health assessment tool within the chatbot system.

2.3.7. Login/Signup

ID: UC08

The healthcare professional accessing the system securely by signing up and logging in with their credentials, which is crucial for protecting sensitive information.

Primary Actors

 Health Care Professional

Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	The healthcare professional is registered with the system and has been assigned login credentials.
Post-conditions	The healthcare professional has access to the system's functionalities according to their permission level.
Author	N/A
Assumptions	N/A

Scenarios

Scenario

1. Healthcare professional opens the login page.
2. Healthcare professional enters username and password.
3. System verifies the credentials.
4. System grants access to the professional's account.

Requirements

Encrypted storage of credentials

ID: UC08.REQ002













The system shall ensure that all user credentials are stored in an encrypted format. Access to the encrypted credentials must be restricted to authorized personnel only, and all access must be logged for audit purposes.

Secure authentication methods

ID: UC08.REQ001

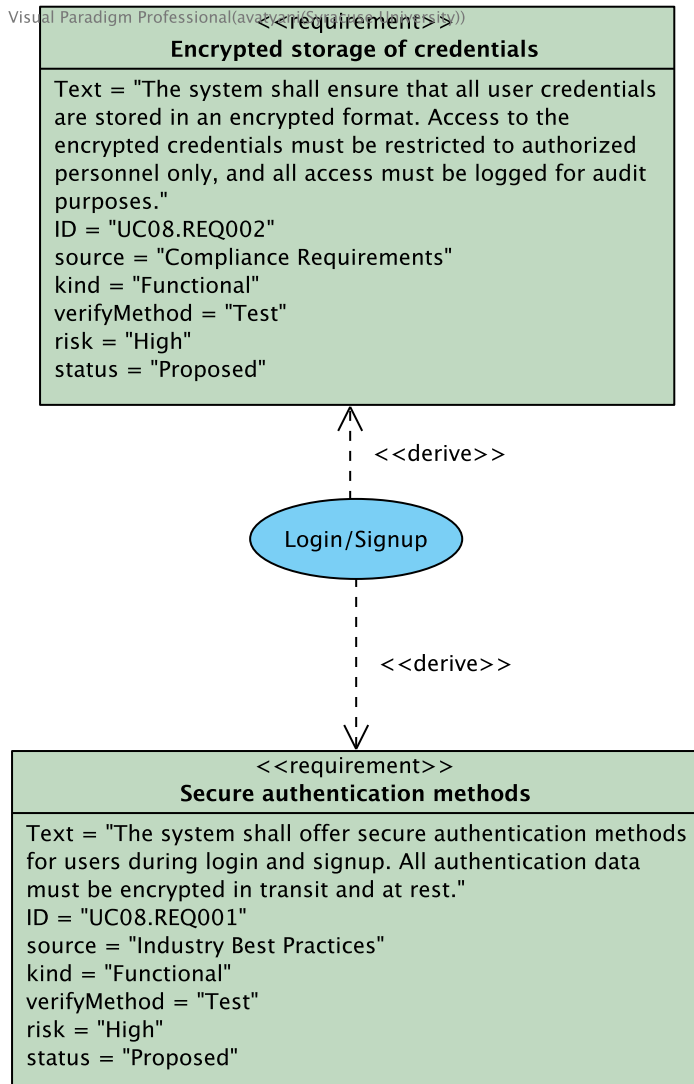
The system shall offer secure authentication methods for users during login and signup. All authentication data must be encrypted in transit and at rest.

Relationships

Relationship	From	To
 unnamed	 Login/Signup	 Encrypted storage of credentials
 unnamed	 Login/Signup	 Secure authentication methods
 unnamed	 Assessment Creator	 Login/Signup
 unnamed	 Health Care Professional	 Login/Signup

Sub Diagrams

Login/Signup Requirement Diagram



2.3.8. Assessment Creator

ID: UC04

Healthcare professionals can use this use case to input and modify questions and answers for the chatbot's assessment tool.

Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	Professional has credentials to access the assessment creation tools.
Post-conditions	Chatbot's assessment dialogue is updated with the new or edited content.
Author	N/A
Assumptions	N/A

Scenarios

Scenario

1. Healthcare professional logs into a separate portal linked to the chatbot.
2. Professional uses an interface to create or edit questions and logic flows.
3. Changes are saved and integrated into the chatbot's dialogue system.

Requirements

 Secure data handling, and ease of use for non-technical professionals.

ID: UC04.REQ002










This requirement necessitates both the secure handling of data, and the creation of an interface that is user-friendly and accessible to individuals without technical expertise, facilitating ease of use and navigation.

 Secure login for professionals, intuitive editing interface, immediate updates to chatbot's database.

ID: UC04.REQ001

This requirement includes developing a secure login system specifically designed for healthcare professionals. Furthermore, it entails creating an intuitive editing interface and mandates immediate updates to the chatbot's database, allowing for the real-time integration of new question sets to improve accuracy.

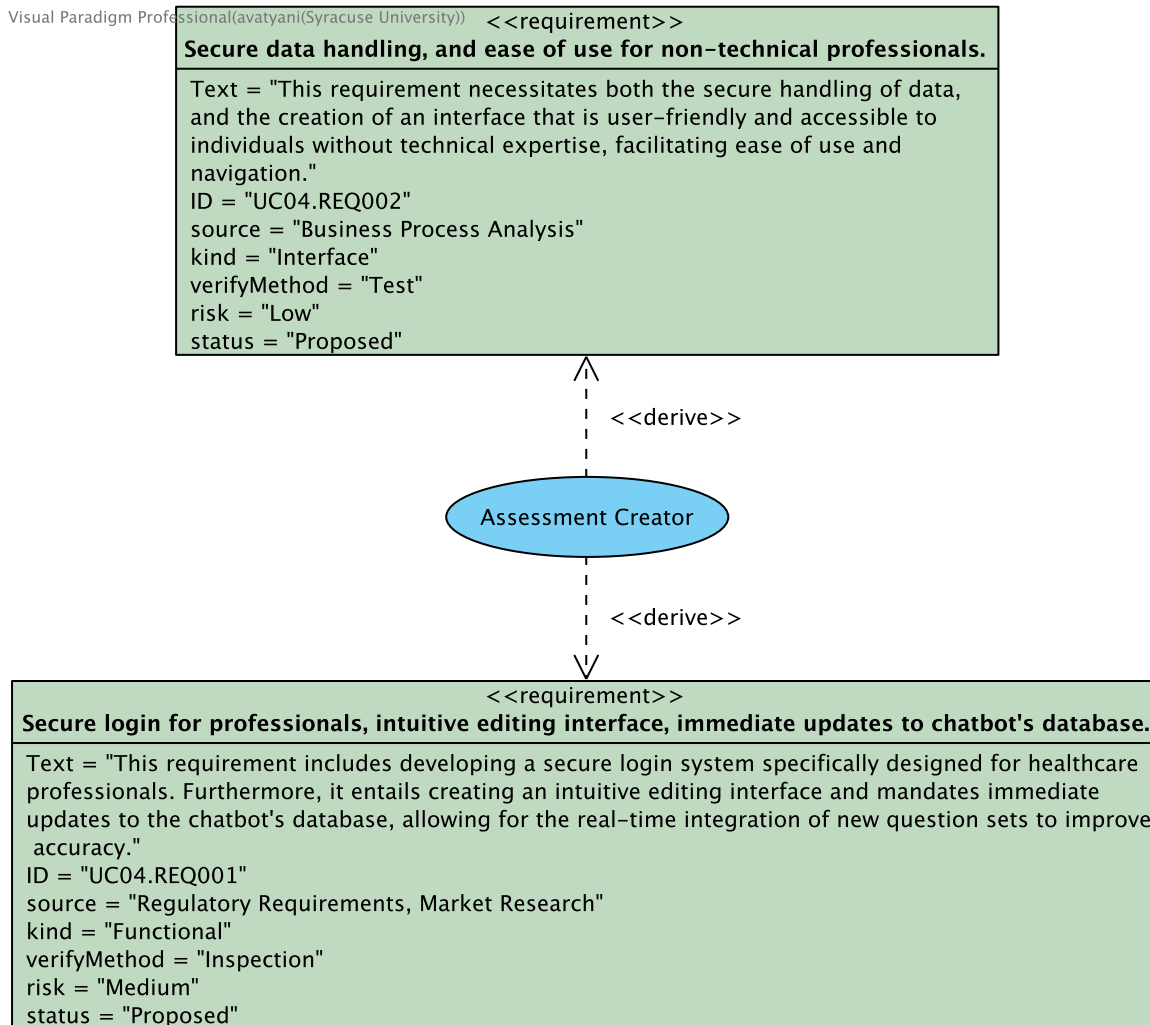
Relationships

Relationship	From	To
 Unnamed	 Assessment Creator	 Secure data handling, and ease of use for non-technical professionals.
 Unnamed	 Assessment Creator	 Secure login for professionals, intuitive editing interface, immediate updates to chatbot's database.
 Unnamed	 Assessment Creator	 Login/Signup

Sub Diagrams

Assessment Creator Requirement Diagram

Visual Paradigm Professional(avatyani(Syracuse University))



Reference Diagrams

2.3.9. Resource Referrals

ID: UC10

User can receive referrals to additional mental health resources directly to their email based on their needs.

Primary Actors

👤 User

Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	The user has provided a valid email address to the chatbot system. Chatbot has access to mental health resources, such as articles, websites, support groups, or mental health professionals, are available and accessible for referral. The user has indicated their consent to receive referrals via email.

Post-conditions	The user receives the email containing the referrals promptly after the chatbot interaction. The user has the option to access the provided referrals and seek further assistance or support as needed.
Author	N/A
Assumptions	N/A

Scenarios

Scenario

1. User selects resource referrals option.
2. Chatbot asks for users' email id.
3. Chatbot identifies appropriate resources based on user needs.
4. Chatbot sends these resources directly to the users' email.

Requirements

Email Integration

ID: UC10.REQ001













The chatbot system must have the capability to integrate with email services to send referrals directly to users' email addresses.

User Consent Management

ID: UC10.REQ002

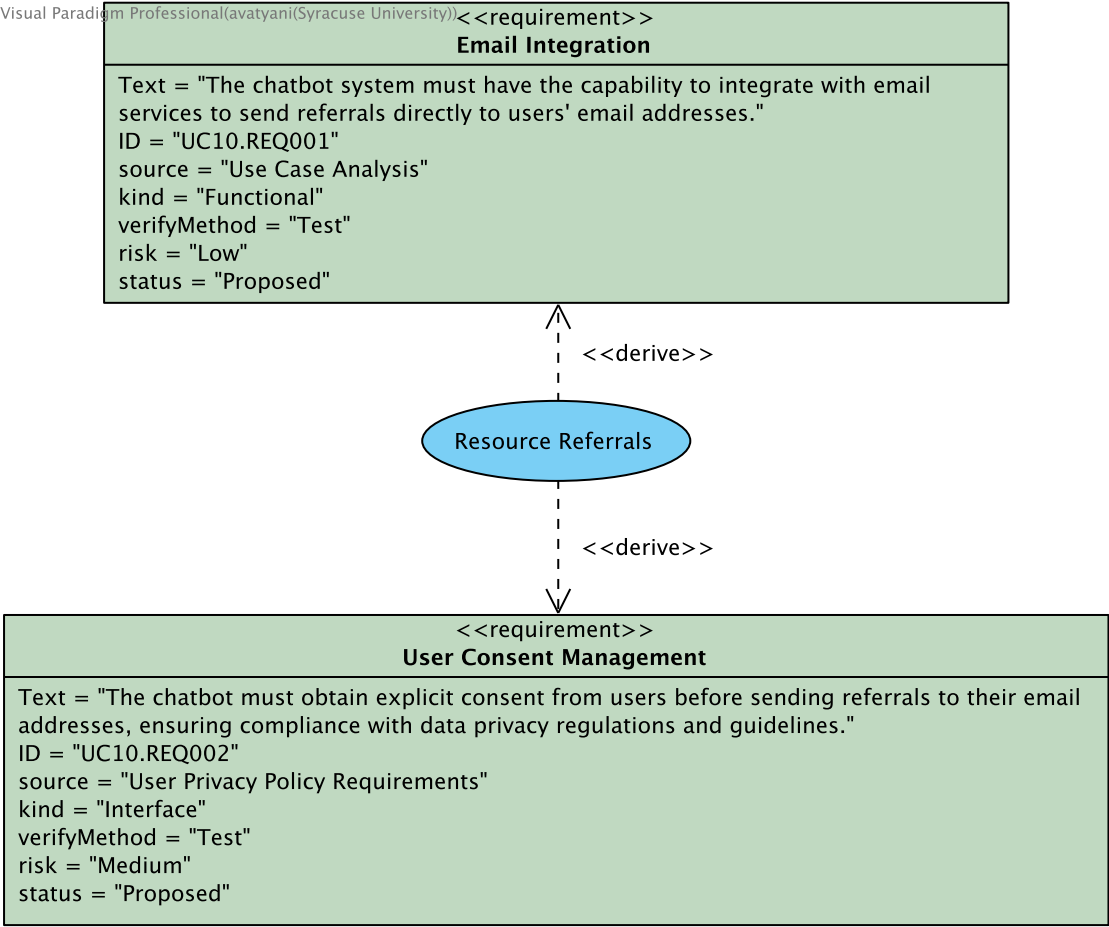
The chatbot must obtain explicit consent from users before sending referrals to their email addresses, ensuring compliance with data privacy regulations and guidelines.

Relationships

Relationship	From	To
 unnamed	 Resource Referrals	 Psychoeducation
 unnamed	 Resource Referrals	 Email Integration
 unnamed	 Resource Referrals	 User Consent Management
 unnamed	 User	 Resource Referrals

Sub Diagrams

Resoruce Referrals Requirement Diagram

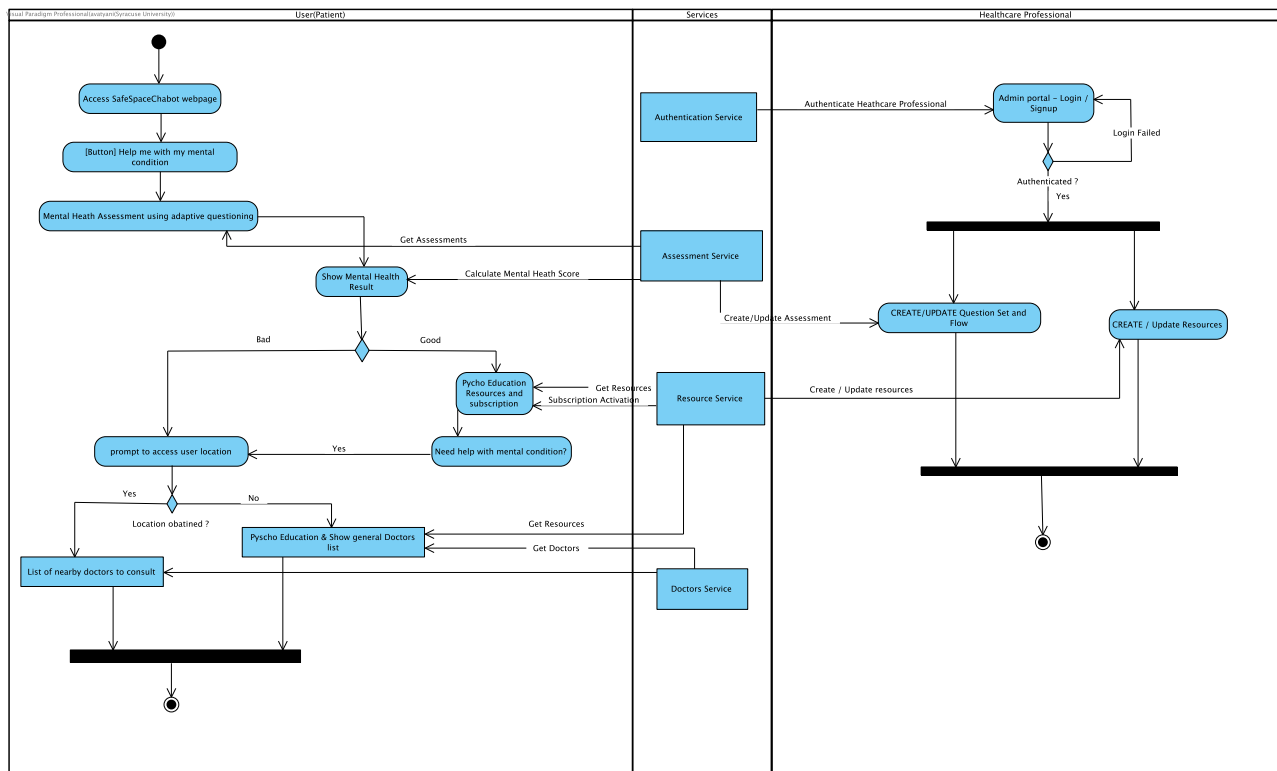


3. SafeSpace Specific Requirements

3.1. Overview

The following use case diagram depicts how the users/patients and healthcare professionals will interact with the system.

3.1.1. SAFESPACEActivity Diagram



Access SafeSpaceChabot webpage

Users/patients will access our SafeSpace chatbot webpage to interact with it.

[Button] Help me with my mental condition

To begin interacting with our SafeSpace chatbot, users need to click on the 'Get Started' button.

Mental Heath Assessment using adaptive questioning

Based on the user's responses, our chatbot will ask follow-up questions to assess the user's mental health.

Show Mental Health Result

This will inform the user about his or her mental health status, and based on the result, it will proceed to the next step.

Pycho Education Resources and subscription

If the user's mental health is in good shape, the chatbot will provide psychoeducation resources to maintain good mental health.

Need help with mental condition?

In addition to psychoeducation resources, the chatbot will offer a 'need help with mental health condition' option if the user feels they still require assistance from a healthcare professional.

prompt to access user location

If the user's mental health is not in good shape, the chatbot will prompt them to share their location to provide a list of nearby healthcare professionals.

List of nearby doctors to consult

If the user grants access to their location, the chatbot will share a list of the best healthcare professionals nearby.

Pyscho Education & Show general Doctors list

If the user does not grant access to their location, the chatbot will share a list of the best mental health resources and healthcare professionals available nationwide.

Admin portal - Login / Signup

The healthcare professional needs to sign up/login.

CREATE/UPDATE Question Set and Flow

The healthcare professional will create/update the question set and determine its flow.

CREATE / Update Resources

Healthcare professional is responsible for creating and updating the mental health resources.

Assessment Service

Healthcare professionals will use this service to create or update question sets.

Authentication Service

This service will authenticate healthcare professionals by verifying their registration with our chatbot.

Doctors Service

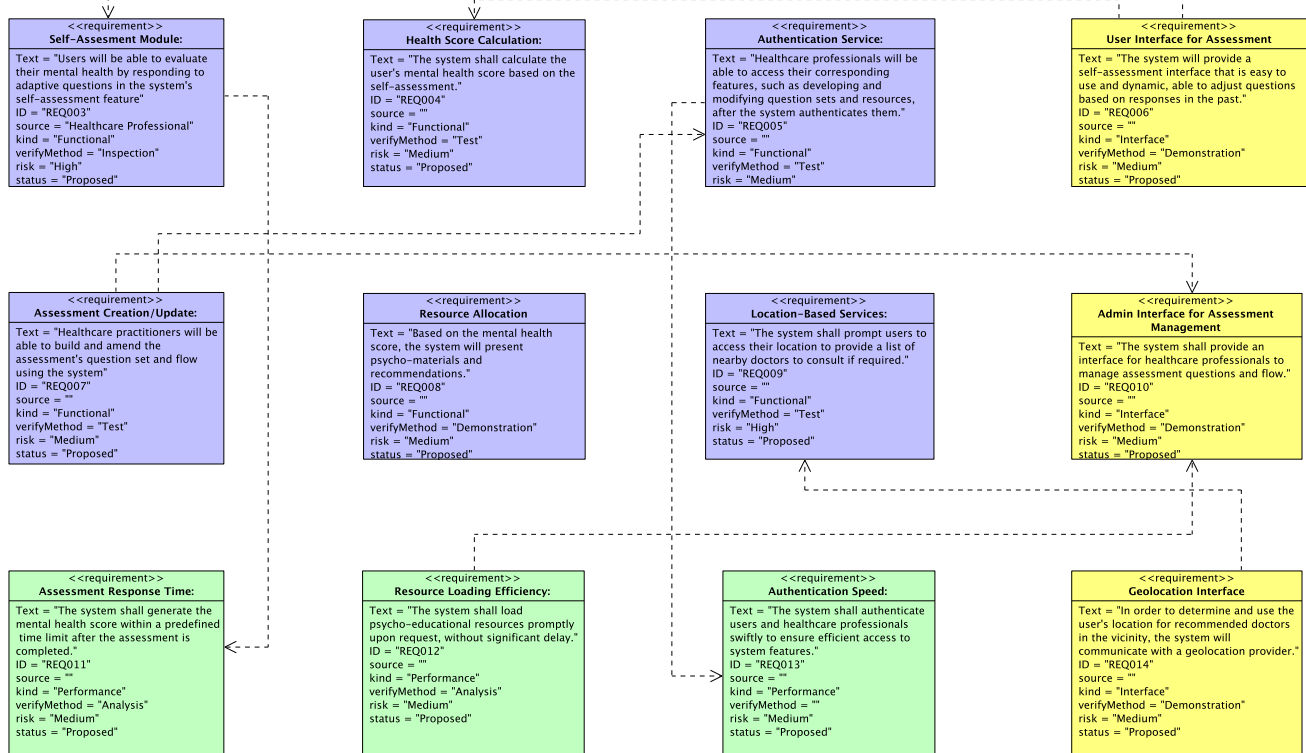
This service will store a list of the best healthcare professionals nationwide and utilize an API to provide a list of nearby doctors to the user.

Resource Service

Healthcare professionals will use this service to create or update mental health resources.

3.1.2. SafeSpace21_System_Requirements_Diagram

Visual Paradigm Professional (Javatyani/Syracuse University)



Admin Interface for Assessment Management

ID: REQ010

The system shall provide an interface for healthcare professionals to manage assessment questions and flow.

Assessment Creation/Update:

ID: REQ007

Healthcare practitioners will be able to build and amend the assessment's question set and flow using the system

Assessment Response Time:

ID: REQ011

The system shall generate the mental health score within a predefined time limit after the assessment is completed.

Authentication Service:

ID: REQ005

Healthcare professionals will be able to access their corresponding features, such as developing and modifying question sets and resources, after the system authenticates them.

Authentication Speed:

ID: REQ013

The system shall authenticate users and healthcare professionals swiftly to ensure efficient access to system features.

Geolocation Interface

ID: REQ014

In order to determine and use the user's location for recommended doctors in the vicinity, the system will communicate with a geolocation provider.

Health Score Calculation:

ID: REQ004

The system shall calculate the user's mental health score based on the self-assessment.

Location-Based Services:

ID: REQ009

The system shall prompt users to access their location to provide a list of nearby doctors to consult if required.

Resource Allocation

ID: REQ008

Based on the mental health score, the system will present psycho-materials and recommendations.

Resource Loading Efficiency:

ID: REQ012

The system shall load psycho-educational resources promptly upon request, without significant delay.

Self-Assessment Module:

ID: REQ003

Users will be able to evaluate their mental health by responding to adaptive questions in the system's self-assessment feature

User Interface for Assessment

ID: REQ006

The system will provide a self-assessment interface that is easy to use and dynamic, able to adjust questions based on responses in the past.

Visual Paradigm



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DoctorsService

An interface for accessing information about doctors registered in the system. It includes functionalities to find nearby doctors based on user location and to fetch detailed information about a doctor's qualifications and availability.

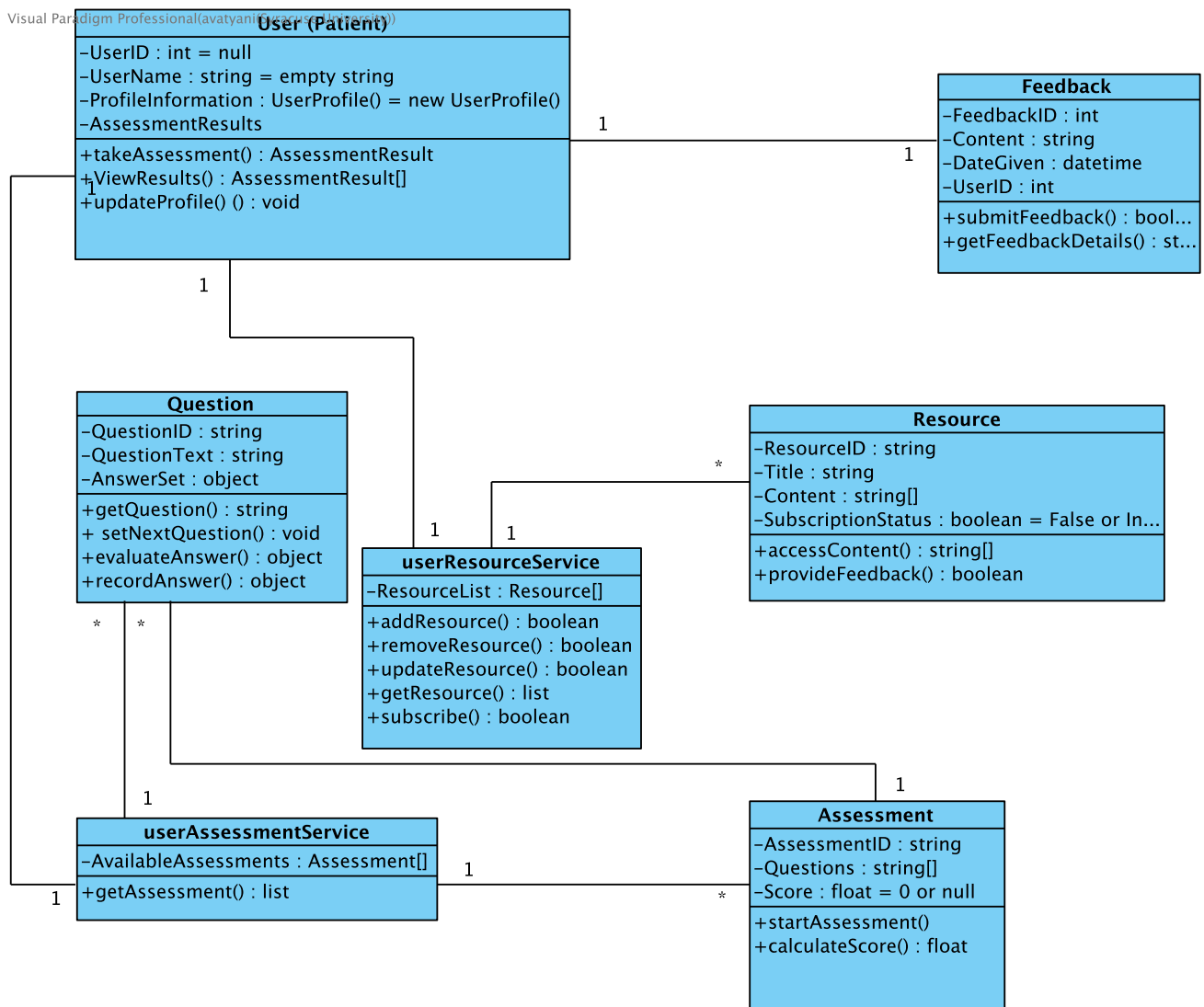
HealthcareProfessional

Represents an individual with the qualifications and credentials to provide healthcare services. This class holds the information relevant to the professional's identity and capabilities within the system, such as their ID, qualifications, and work schedule. It also provides methods to perform professional duties like creating assessments for patients and managing resources.

ResourceServiceHp

Manages the resources available to users in the healthcare system. This class keeps track of all the resources through a list and provides methods to add new resources, remove existing ones, and update resource details.

3.1.4. SafeSpace_Class_Diagram_Users



Assessment

Encapsulates the information regarding medical assessments. It contains a unique ID for the assessment, a collection of questions, and a score. The class includes methods to calculate the assessment score, retrieve the questions, and record the answers given by a patient.

Feedback

Manages the collection, storage, and retrieval of feedback provided by users of the system. It contains details about the feedback content, the date it was given, and the user who provided it. The class includes methods for submitting new feedback, retrieving details for review, and responding to user comments.

Question

Manages the questions included in an assessment. This class stores the question ID, the text of the question, the available answer options, and the next question in the sequence. It provides methods to get the text of a question, set the subsequent question in an assessment, and evaluate the given answer.

Resource

Represents educational or informational resources within the healthcare system. It includes attributes for the resource's ID, title, content, and subscription status. The class provides methods for accessing the content, subscribing to the resource for updates, and providing feedback.

User (Patient)

Represents a patient within the healthcare system. This class is responsible for storing personal details such as identification, name, and password. It also holds profile information and assessment results. Patients can take assessments, view their results, and update their profiles.

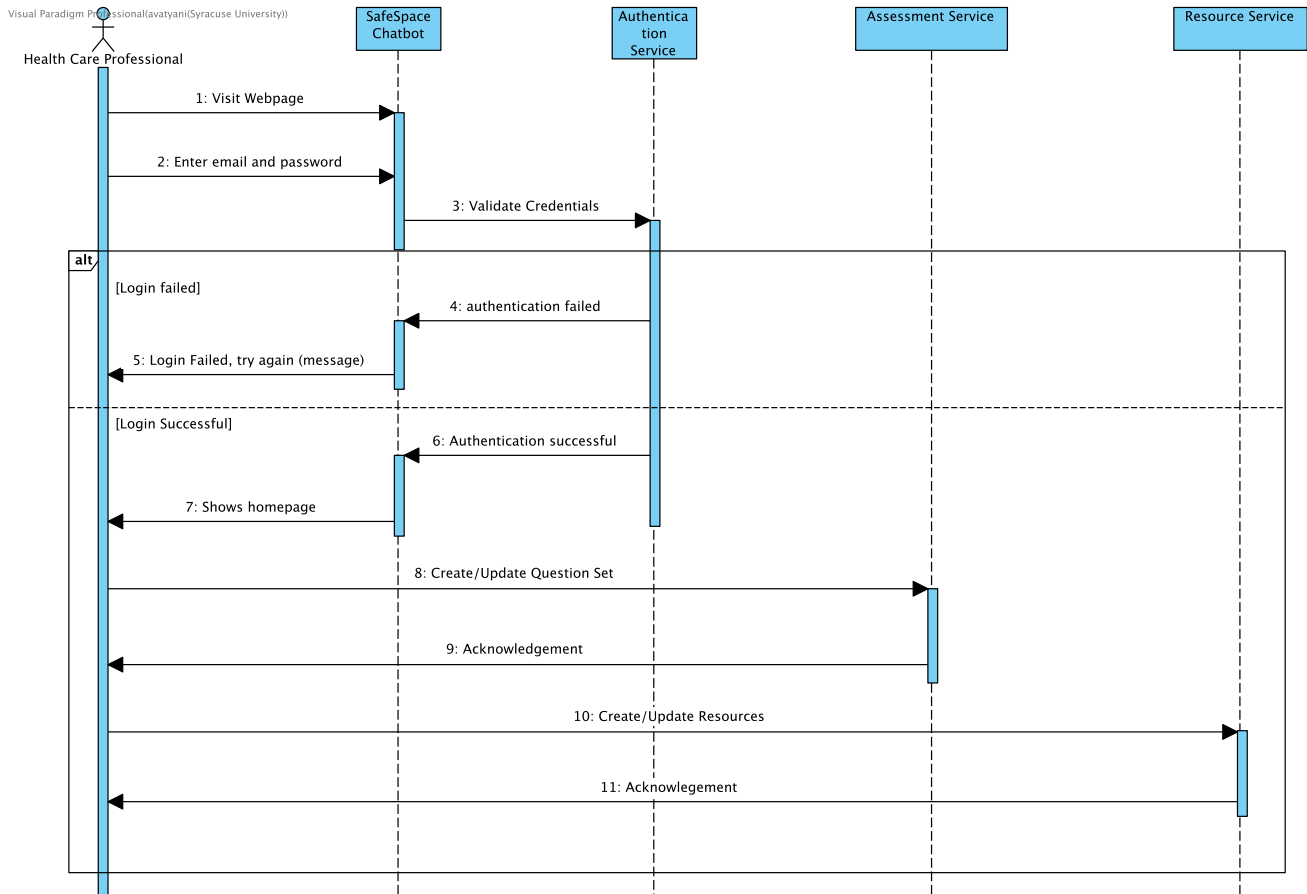
userAssessmentService

Manages the lifecycle of assessments within the system. It holds a list of available assessments and includes methods to create new assessments, update existing ones, and delete them from the system.

userResourceService

Manages the resources available to users in the healthcare system. This class keeps track of all the resources through a list and provides methods to add new resources, remove existing ones, and update resource details.

3.1.5. Healthcare Professional Sequence Diagram



Health Care Professional

The healthcare professional serves as the creator of the mental health assessment tool within the chatbot system.

SafeSpace Chatbot

This is the interface that healthcare professional will interact with.

Authentication Service

This service will authenticate healthcare professionals' login.

Login failed

In case of login failure, try again message will be appear on screen.

Assessment Service

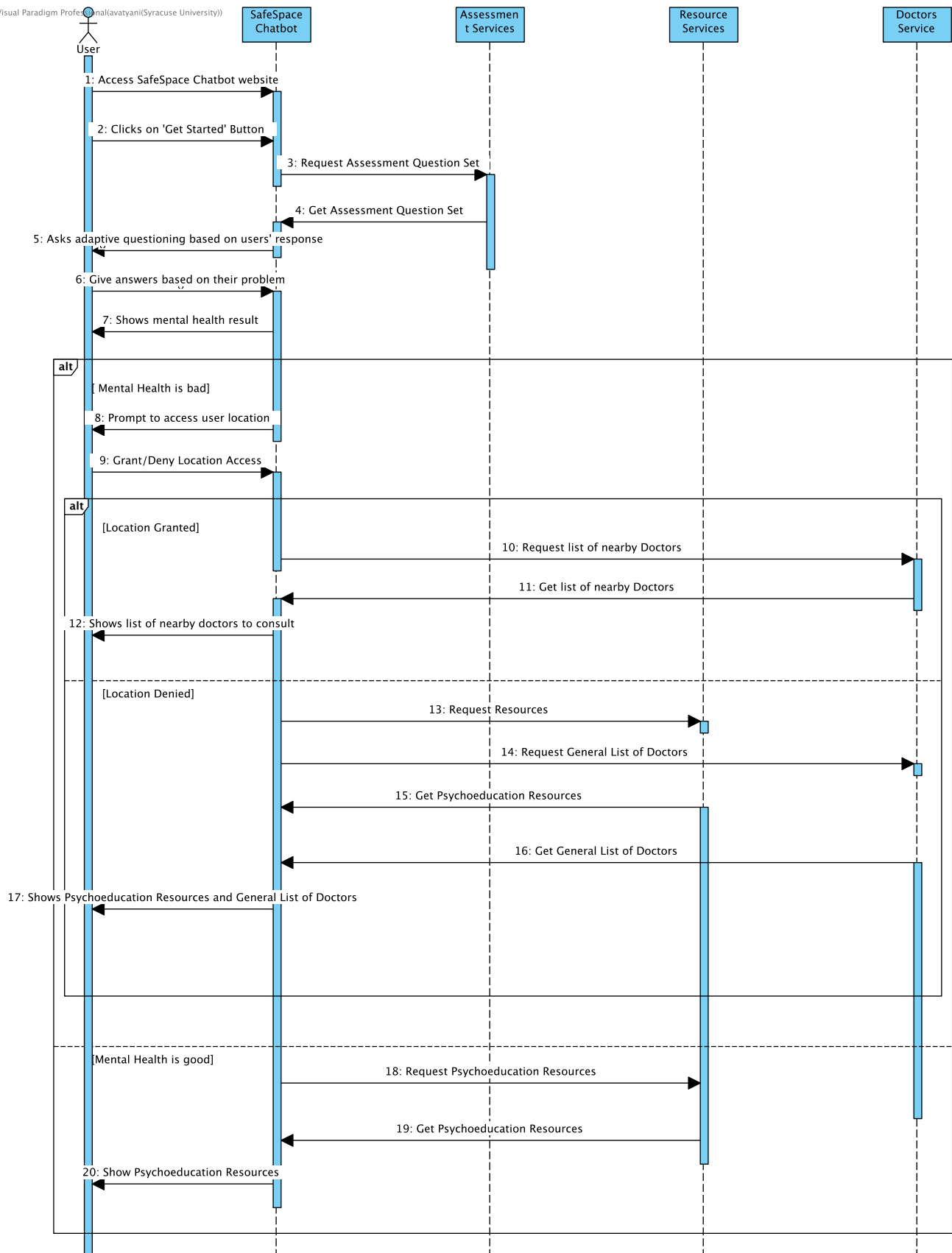
This service will be used by healthcare professional to create, update and delete questions from the assessment database.

Resource Service

This service will be used by healthcare professional to create, update and delete resources from the resource database.

3.1.6. User Sequence Diagram

Visual Paradigm Professional (avatyani(Syracuse University))



The user represents individuals who interact with the mental health chatbot to assess their mental well-being, seek resources, and receive support.

SafeSpace Chatbot

This is the interface that user will interact with.

Assessment Services

This service will get assessment set from backend and show it to user based on their response.

Resource Services

This service will display resources to User/Patient.

Doctors Service

This service will get users' location and display list of doctors based on their location.

Mental Health is bad

If mental health is bad, then in that case, our chatbot will attempt to obtain the user's location. If mental health is in good shape, it will show psychoeducation resources.

Location Granted

If location access is granted then it will show list of nearby doctors. If location access is denied then it will show psychoeducation resources along with general list of doctors.