



American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

PROJECT TITLE: BreathEase
An AI-Powered Solution for Stress and Anxiety Management.

A Software Engineering Project Submitted By

Semester: Summer_21_22		Section:	Group Number:	
SN	Student Name	Student ID	Contribution (CO3+CO4)	Individual Marks
1	DIBAJIT ROY	22-48569-3		
2	NABIB AHAMED SUJAN	23-51193-1		
3	MAHBUB HASAN MITHIL	22-48560-3		
4	TONIMA ISLAM	22-48325-3		
5	MST. FAHMIDA ZAMAN	23-50291-1		

Supervised By
SAEEDA SHARMEEN

Description of Student's Contribution in the Project work

Student Name: DIBAJIT ROY

Student ID: 22-48569-3

Contribution in Percentage (20%):

Contribution in the Project:

- Background of the problem
- Solution of the problem
- Model selection
- Project Roles and Responsibilities

Signature of the Student

Student Name: NABIB AHAMED SUJAN

Student ID: 23-51193-1

Contribution in Percentage (20%):

Contribution in the Project:

- Background of the problem
- Solution of the problem
- Project Roles and Responsibilities

Signature of the Student

Student Name: MAHBUB HASAN MITHIL

Student ID: 22-48560-3

Contribution in Percentage (20%):

Contribution in the Project:

- Background of the problem
- Solution of the problem
- Model selection
- Project Roles and Responsibilities

Signature of the Student

Student Name: TONIMA ISLAM

Student ID: 22-48325-3

Contribution in Percentage (20%):

Contribution in the Project:

- Background of the problem
- Solution of the problem
- Project Roles and Responsibilities

Signature of the Student

Student Name: MST. FAHMIDA ZAMAN

Student ID: 23-50291-1

Contribution in Percentage (20%):

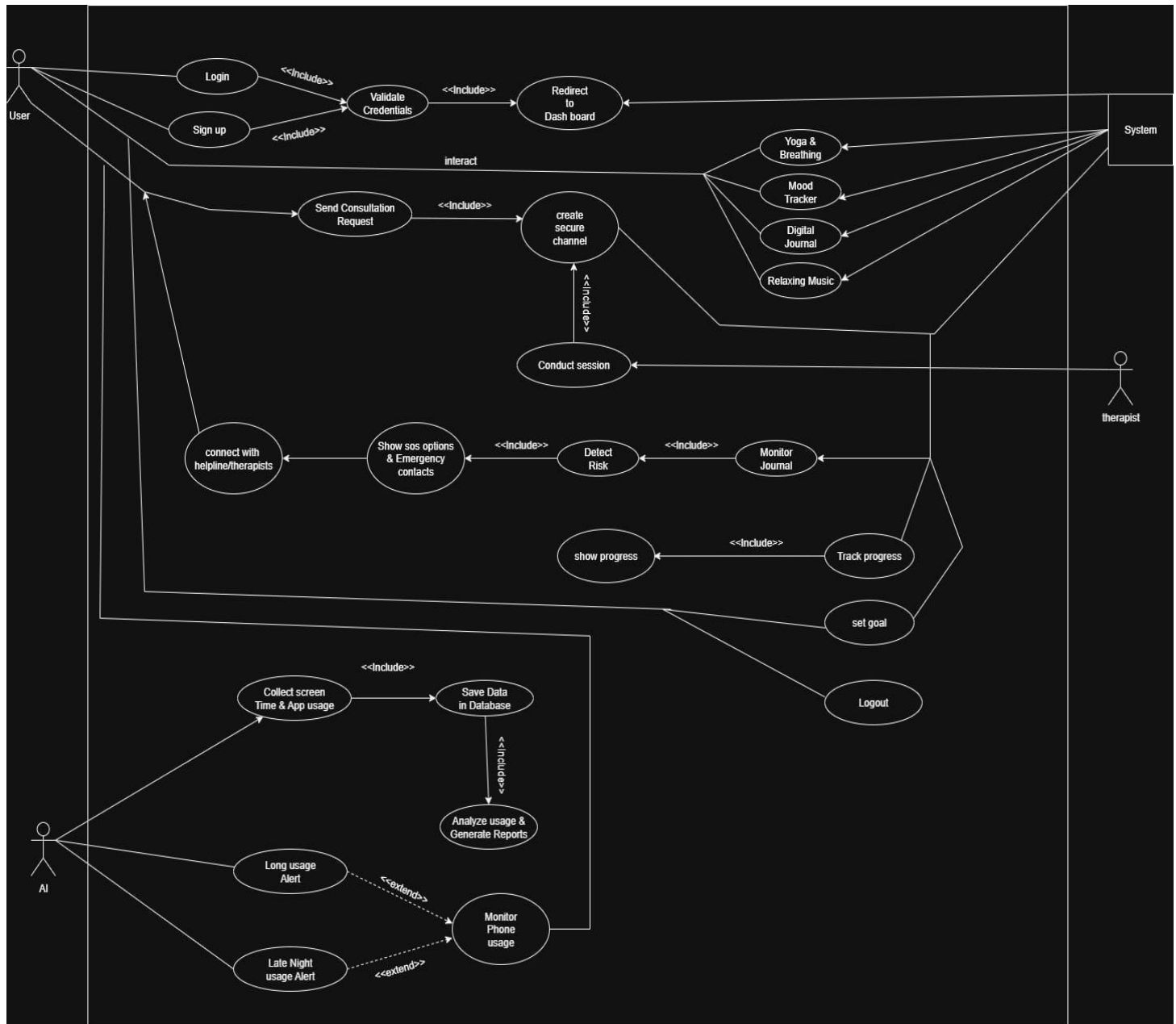
Contribution in the Project:

- Background of the problem
- Solution of the problem
- Project Roles and Responsibilities

Signature of the Student

1. Diagram (Draw-io):

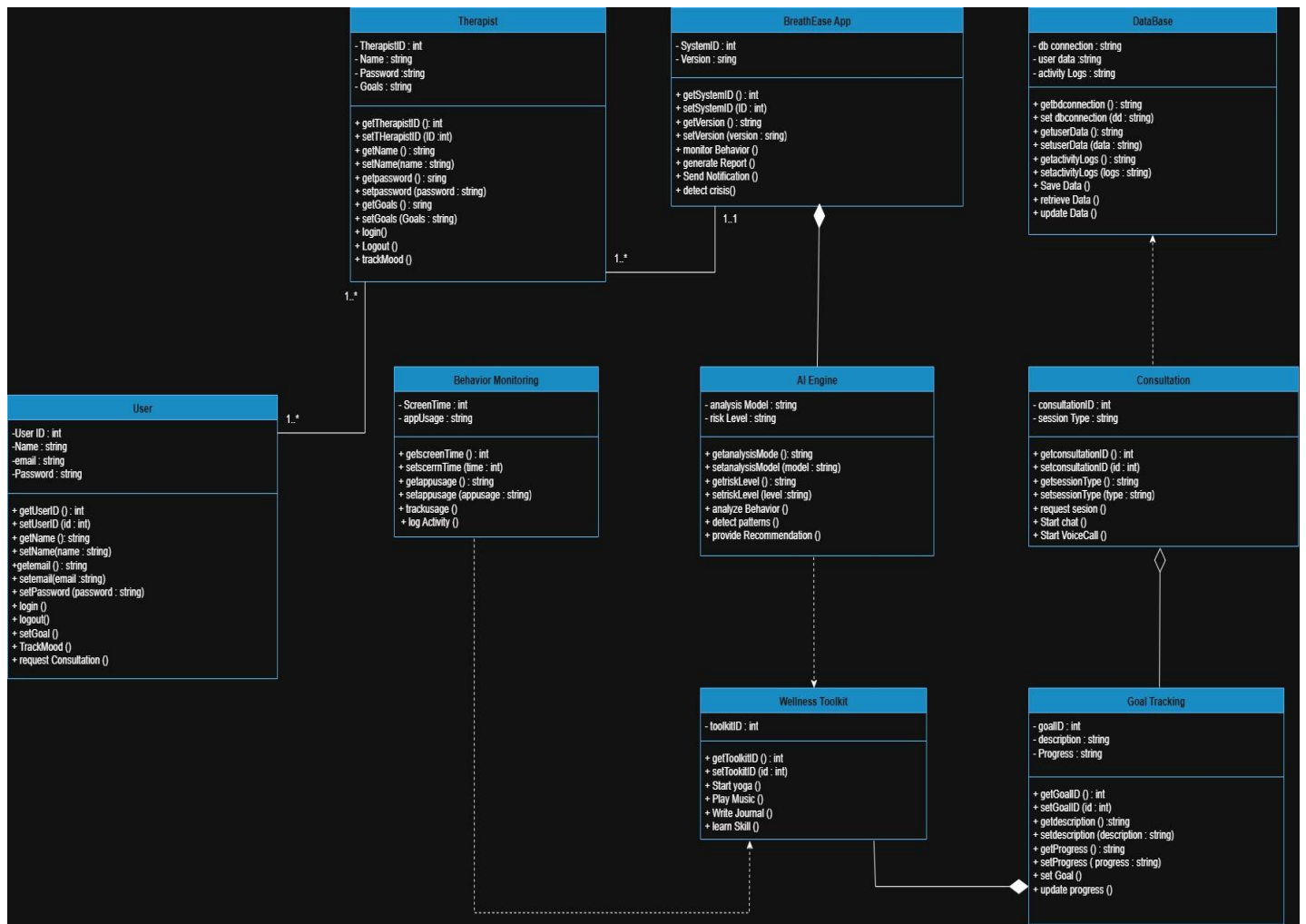
Use Case Diagram:



Description:

The diagram outlines the user interactions and system functions for a "BreathEase App". The main actors are the User and the Therapist. A User can register, manage their profile, track their mood, and book consultations. The app's core functionality, powered by an AI Engine, allows the system to monitor behavior, determine risk, and provide personalized recommendations to the user, who can also access a Wellness Toolkit. The Therapist can manage their own profile and view the user's data to provide support

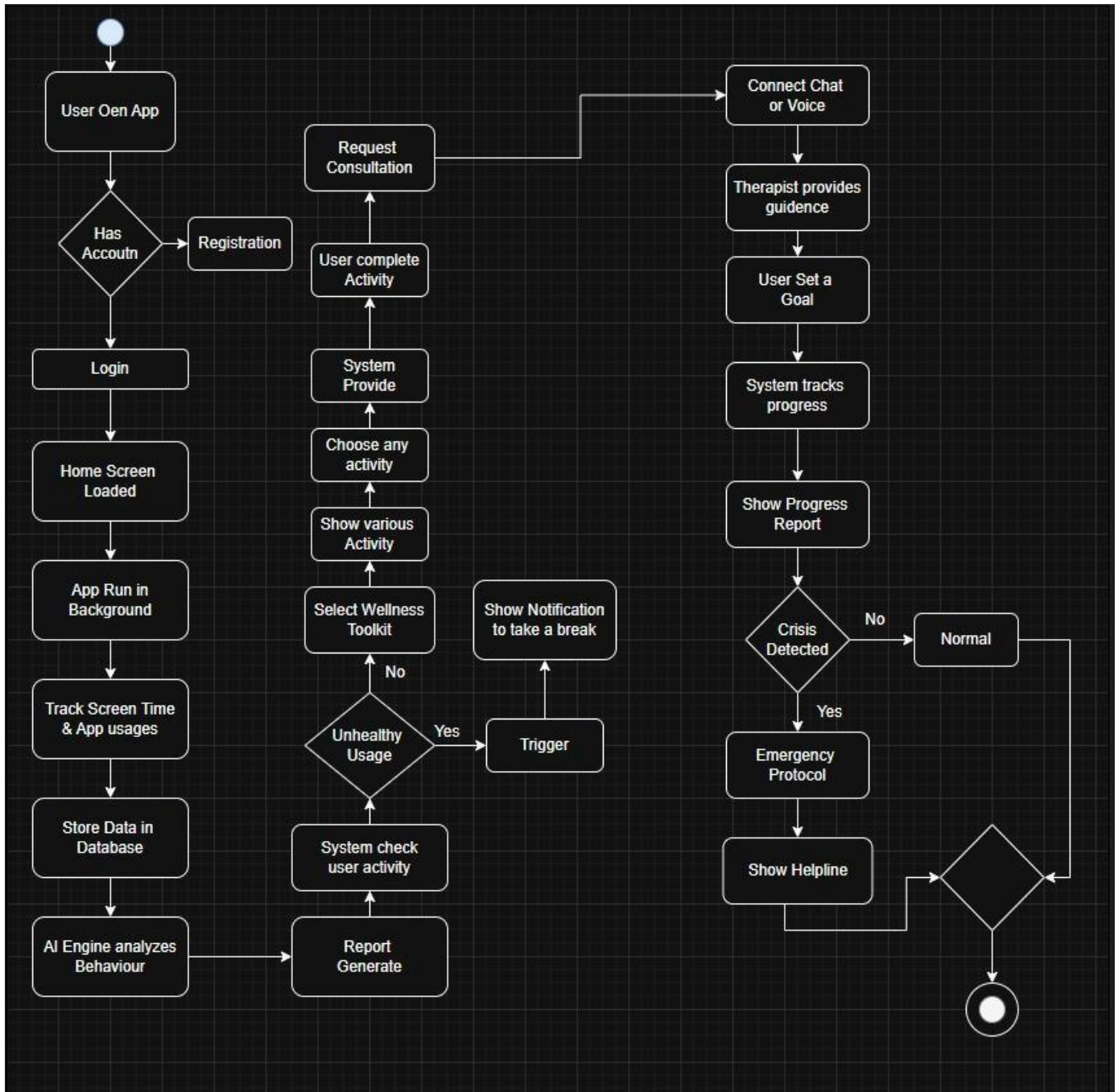
Class Diagram:



Description:

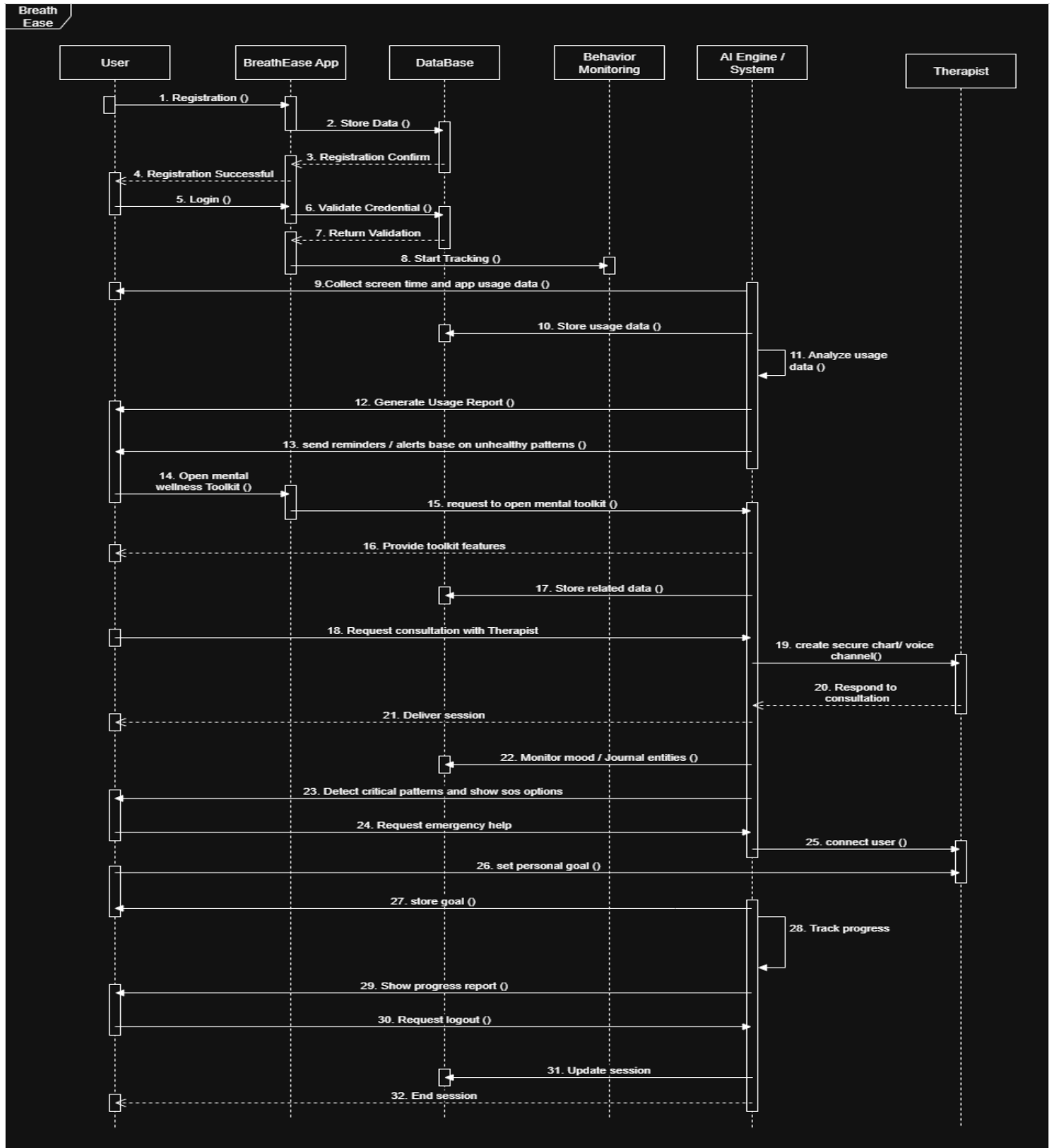
The diagram shows relationships like association (e.g., User to Behavior Monitoring, User to Wellness Toolkit), aggregation (e.g., Therapist to User), and dependency (e.g., AI Engine to Behavior Monitoring). The numbers (e.g., "1..*", "1.1") indicate multiplicity, showing how many instances of one class can be related to instances of another. For instance, one User can be associated with multiple Behavior Monitoring records.

Activity Diagram:



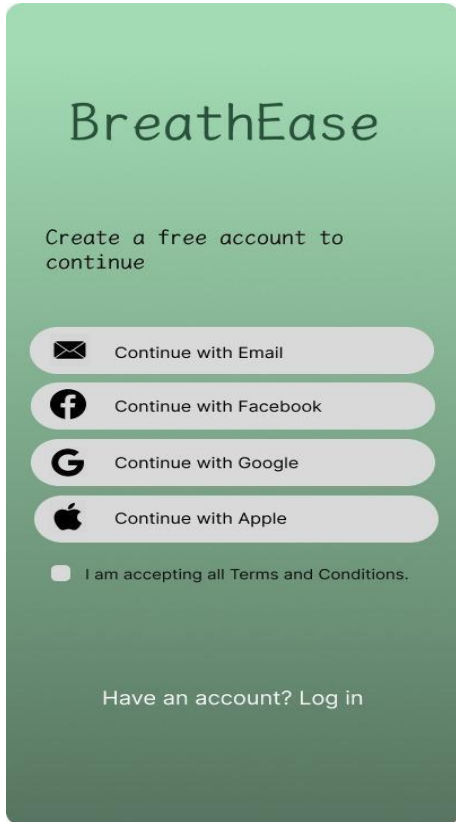
Description: The activity diagram shows how the BreathEase App supports users through AI monitoring and therapist consultation. After registration or login, the system tracks screen time, stores data, and analyzes behavior. If unhealthy usage is detected, notifications and wellness activities are provided. Users can request consultation, set goals with therapist guidance, and track progress. In case of crisis, the system triggers emergency protocols and displays the helpline; otherwise, users continue normally.

Sequence Diagram:



Description: The provided sequence diagram illustrates the chronological interactions between different components of the "BreathEase App" system. It details the flow of messages for key processes such as user registration, login, data tracking, and consultation initiation. For instance, a user's registration involves the app storing data in the database and receiving confirmation, followed by login validation. The AI Engine analyzes usage data to generate reports and send reminders, while users can access the wellness toolkit and request consultations, leading to sessions with therapists. The diagram visually represents how these elements work together over time to deliver the app's functionality.

2. UI Design (Figma):



BreathEase

Create a free account to continue

Continue with Email

Continue with Facebook

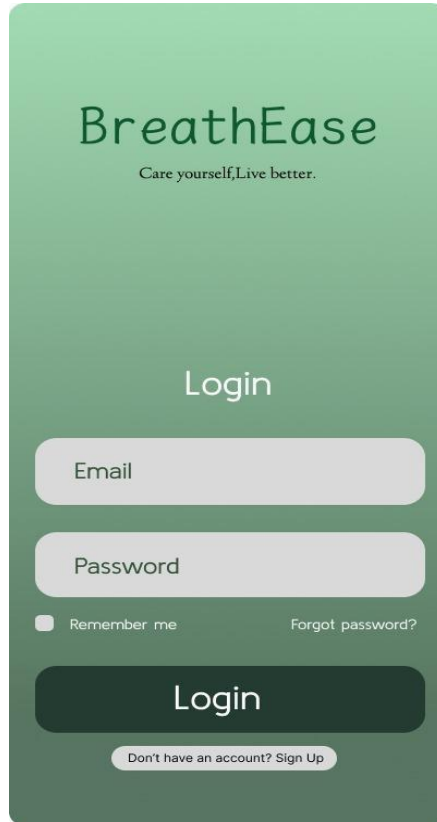
Continue with Google

Continue with Apple

☐ I am accepting all Terms and Conditions.

Have an account? Log in

Page NO.1



BreathEase

Care yourself, Live better.

Login

Email

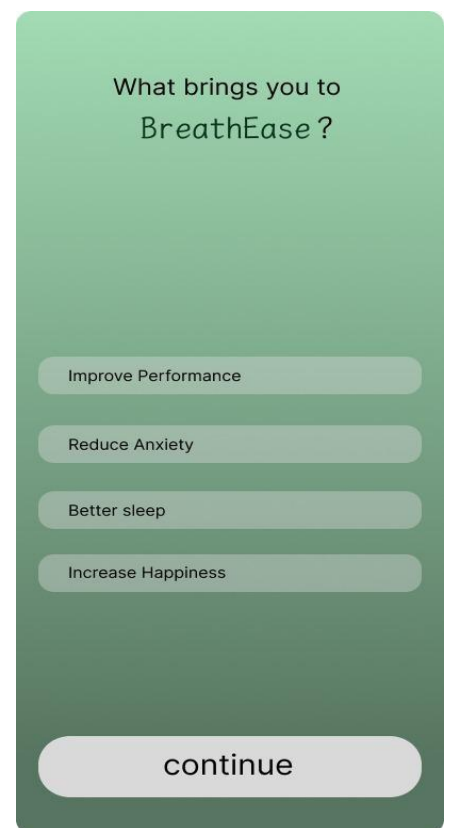
Password

☐ Remember me [Forgot password?](#)

Login

[Don't have an account? Sign Up](#)

Page NO.2



What brings you to BreathEase?

Improve Performance

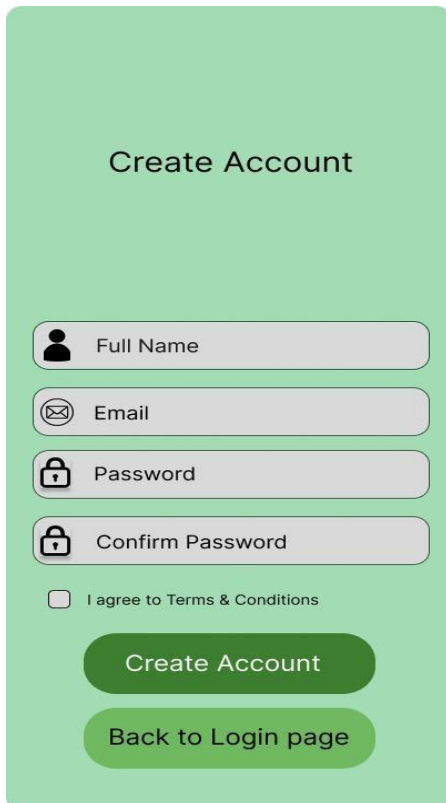
Reduce Anxiety

Better sleep

Increase Happiness

continue

Page NO.3



Create Account

Full Name

Email

Password

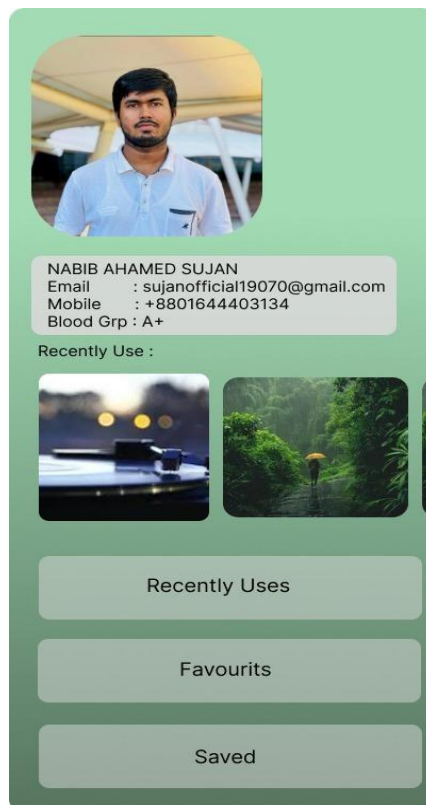
Confirm Password


☐ I agree to Terms & Conditions

Create Account

Back to Login page



Page No.4





NABIB AHAMED SUJAN
Email : sujanofficial19070@gmail.com
Mobile : +8801644403134
Blood Grp : A+

Recently Use :

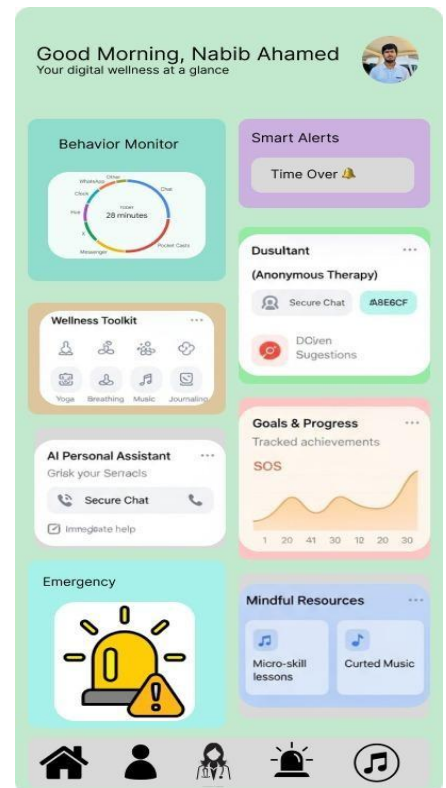
 

Recently Uses


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Page No.5



Good Morning, Nabib Ahamed
Your digital wellness at a glance



Behavior Monitor

Smart Alerts

Time Over

Dusultant
(Anonymous Therapy)

Secure Chat

DOven Sugestions

Wellness Toolkit

Yoga Breathing Music Journaling

AI Personal Assistant

Grlek your Serracks

Secure Chat

Immegste help

Goals & Progress

Tracked achievements


SOS






Mindful Resources

Micro-skill lessons

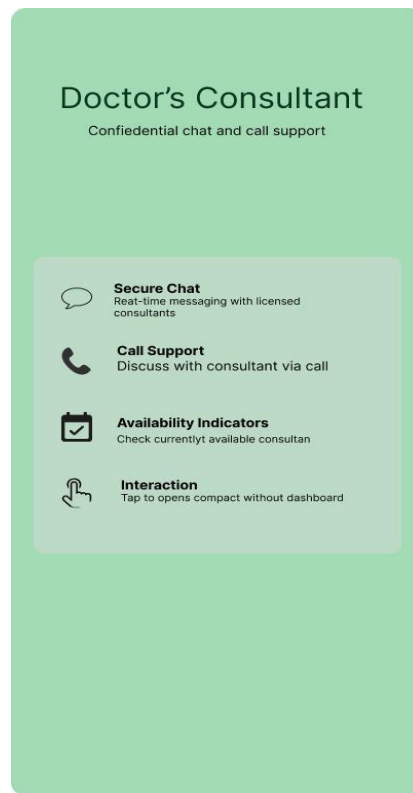
Curtd Music

Emergency



Page No.6



Page NO.7

Page NO.8

BreathEase App – Page Flow Documentation:

Page No.	Page Name	Description
1	Welcome / Sign Up Options	User can sign up using Email, Facebook, Google, or Apple.
2	Login	User enters Email and Password to access account.
3	User Goals	User selects goals like Improve Performance, Reduce Anxiety, Better Sleep, Increase Happiness.
4	Create Account	Form to create a new account with Full Name, Email, Password, and Confirm Password.
5	Profile	Displays user info, Recently Used, Favorites, and Saved items.
6	Dashboard	Main screen with Behavior Monitor, Smart Alerts, Wellness Tracker, AI Assistant, and Resources.
7	Behavior Monitor	Shows Daily Screen Time, App Usage Breakdown, Usage Trends, and Risk Warnings.
8	Doctor's Consultant	Provides Secure Chat, Call Support, Availability Indicators, and Intervention options.

3. Project Estimation and Expected Budget Calculation:

Why our project is considered Organic:

- Small team (3–5 people)
- Low complexity work
- Clear and stable project scope and requirements
- Simple and familiar technology

Therefore, our calculations (PM, DM, ST) are based on the Organic project type.

PM (Person-Months): The amount of work one person can complete in one month; represents total effort required for the project.

SLOC (Source Lines of Code): Total number of lines of source code written in the project.

DM (Development Months / Duration in Months): Total time required to complete the project, measured in months.

ST (Staffing / Required People): Total number of people required to complete the project.

Project Estimation

Project Type: Organic

Were,

$$P = 1.05$$

$$T = 0.38$$

$$\text{Coefficient} = 2.4$$

$$\text{SLOC} = 17,000$$

Now,

$$\text{PM} = \text{Coefficient} \times (\text{Effort Factor}) * (\text{SLOC} / 1000) ^ P$$

$$= 2.4 * (17,000/1000) ^ 1.05$$

$$= 47.01$$

$$\text{DM} = 2.50 * (47.01) ^ 0.38$$

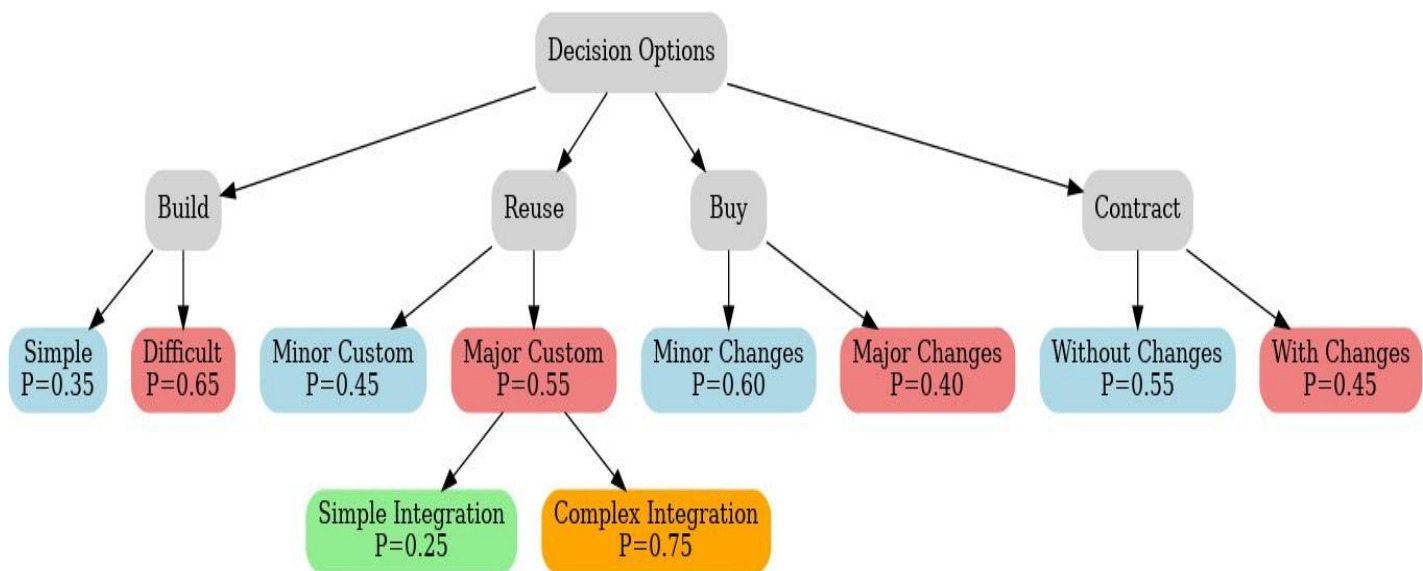
$$= 10.80 \approx 11(\text{week})$$

$$\text{Required number of people} = \text{ST} = \text{PM} / \text{DM} = 47.01 / 11 = 4.27 \approx 4$$

Note:

Although the required number of people is approximately 4, to ensure better efficiency and timely completion, we will assign 5 people to the project.

Decision Tree for Budget Estimation of Development Options:



Build

Simple ($P = 0.35$) \rightarrow \$50,000

Complex ($P = 0.65$) \rightarrow \$120,000

Reuse

Minor Customization ($P = 0.45$) \rightarrow \$30,000

Major Customization ($P = 0.55$):

- Simple Change ($P = 0.25$) \rightarrow \$40,000
- Complex Change ($P = 0.75$) \rightarrow \$90,000

Buy

Minor Change ($P = 0.60$) \rightarrow \$20,000

Major Change ($P = 0.40$) \rightarrow \$60,000

Contract

Without Change ($P = 0.55$) \rightarrow \$15,000

With Change ($P = 0.45$) \rightarrow \$45,000

Expected Budget (Per Option)

1. Build

$$\begin{aligned}\text{Expected (Build)} &= 0.35 \times 50,000 + 0.65 \times 120,000 \\ &= 17,500 + 78,000 \\ &= \$95,500\end{aligned}$$

2) Reuse

First, calculate inside Major Custom:

$$(\text{Major Custom}) = 0.25 \times 40,000 + 0.75 \times 90,000 = 10,000 + 67,500 = 77,500$$

Then full Reuse:

$$\begin{aligned}\text{Expected (Reuse)} &= 0.45 \times 30,000 + 0.55 \times 77,500 \\ &= 13,500 + 42,625 \\ &= \$56,125\end{aligned}$$

3) Buy

$$\begin{aligned}\text{Expected (Buy)} &= 0.60 \times 20,000 + 0.40 \times 60,000 \\ &= 12,000 + 24,000 \\ &= \$36,000\end{aligned}$$

4) Contract

$$\begin{aligned}\text{Expected (Contract)} &= 0.55 \times 15,000 + 0.45 \times 45,000 \\ &= 8,250 + 20,250 \\ &= \$28,500\end{aligned}$$

Total Expected Budget

$$\begin{aligned}\text{Total} &= 95,500 + 56,125 + 36,000 + 28,500 \\ &= \$216,125\end{aligned}$$

4. Risk Management:

Risk Management Plan for BreathEase Project:

Risk	Category	Probability	Impact	Risk Mitigation/Management Strategy
AI may misinterpret user's emotional state	Technology (TE)	40%	3	Incorporate human therapist review for critical cases and continuous AI model updates.
User data privacy	Customer/User (CU)	30%	3	Use end-to-end encryption,

breaches				anonymization, and comply with GDPR/CCPA.
Low user engagement over time	Business Impact (BU)	50%	2	Add gamification, streak tracking, and regular motivational content.
Excessive reliance on AI instead of human experts	Business/Technology (BU/TE)	40%	2	Integrate hybrid model: AI + live consultation option.
Social stigma prevents app adoption	Customer/User (CU)	60%	2	Enable anonymous consultations and awareness campaigns.
App crashes during peak usage	Product Size (PS)	30%	3	Stress testing, scalable cloud infrastructure, and load balancing.
Delayed emergency support detection	Technology (TE)	20%	3	Implement multi-signal crisis detection and emergency helplines integration.
Lack of training for development tools	Development Environment (DE)	40%	2	Provide training sessions and detailed documentation.
Team inexperience in AI/ML	Staff Experience (ST)	50%	2	Conduct workshops, hire AI consultants, and peer-learning programs.
Changing requirements after Baseline	Product Size (PS)	70%	2	Use (Scrum) with iterative sprints and frequent reviews.

Impact Values and Category Notations

Impact Value / Category	Notation
1 – catastrophic	PS – Product size
2 – critical	BU – Business Impact
3 – marginal	CU – Customer Characteristics
4 – negligible	TE – Technology to be built
	DE – Development environment
	ST – Staff size and Experience

Budget Allocation per Risk

Risk	Estimated Cost (\$) Formula: Base × Probability × (5 – Impact)	Notes
AI may misinterpret user's emotional state	\$4,000	P=40%, Impact=3, Weight=2. Model retraining, therapist supervision integration
User data privacy breaches	\$3,000	P=30%, Impact=3, Weight=2. Encryption, secure cloud, compliance audits
Low user engagement over time	\$7,500	P=50%, Impact=2, Weight=3. Gamification, reward systems, retention campaigns
Excessive reliance on AI instead of human experts	\$6,000	P=40%, Impact=2, Weight=3. Hybrid AI + therapist support integration
Social stigma prevents app adoption	\$9,000	P=60%, Impact=2, Weight=3. Awareness campaigns, anonymous consultations
App crashes during peak usage	\$3,000	P=30%, Impact=3, Weight=2. Load testing, auto-scaling, infra upgrades
Delayed emergency support detection	\$2,000	P=20%, Impact=3, Weight=2. Multi-signal crisis detection, SOS integration
Lack of training for development tools	\$6,000	P=40%, Impact=2, Weight=3. Team training, workshops, documentation
Team inexperience in AI/ML	\$7,500	P=50%, Impact=2, Weight=3. Workshops, consultants, skill development
Changing requirements from stakeholders	\$10,500	P=70%, Impact=2, Weight=3. Agile sprint buffers, stakeholder workshops

Total Estimated Risk Management Budget = **\$58,500**

5. Gantt Chart (Notion)



The project is planned for a total duration of 11 weeks. All the main tasks and activities will be completed within the first 10 weeks, ensuring that every milestone and deliverable is achieved on time. The remaining 1 week will be kept as a buffer or extra time to handle any unexpected delays, revisions, or final checks. This approach ensures that the project stays on track while also maintaining flexibility for adjustments if needed.

Workload Distribution

1. Project Initiation and Planning (July 1 – July 7, 2025)

Task	Assigned Staff	Backup
Problem and Solution Identification	Full Team	Tonima
Selection of Development Methodology	Full Team	Tonima
Role Finalization	Dibajit Roy	Tonima
Initial Product Backlog Creation	Fahmida	Tonima
Tool and Environment Setup	Mithil	Tonima

2. Requirement Analysis (July 9 – July 14, 2025)

Task	Assigned Staff	Backup
Collect Functional and Non-Functional Requirements	Nabib	Tonima
Draft User Stories	Nabib	Tonima
Backlog Prioritization	Dibajit Roy	Tonima

3. System Design and Prototyping (July 15 – July 21, 2025)

Task	Assigned Staff	Backup
Diagram (Class, Activity, Sequence)	Fahmida, Mithil	Tonima
Prototype Design	Nabib, Dibajit Roy	Tonima

4. Project Estimation (July 22 – July 26, 2025)

Task	Assigned Staff	Backup
Effort Estimation	Mithil	Tonima
Cost Estimation (Using COCOMO method)	Mithil	Tonima

5. Development and Testing (July 29 – August 29, 2025)

Task	Assigned Staff	Backup
Coding/Development	Full Team	Tonima
Testing	Dibajit Roy, Fahmida	Tonima
Unit and Integration Testing	Nabib	Tonima
System Testing	Nabib, Dibajit Roy	Tonima
User Acceptance Testing	Fahmida, Mithil	Tonima

6. Maintenance and Documentation (August 1, 2025 – September 5, 2026)

Task	Assigned Staff	Backup
Maintenance and Support	Full Team	Tonima
Documentation	Full Team	Tonima

Note: In case of workload pressure, unexpected issues, or if specialized input is required, **Tonima** will act as an expert backup for tasks related to requirement analysis, system design, estimation, and testing.

References

1. Sommerville, I. (2011). *Software Engineering* (9th ed.). Boston, MA: Pearson. Retrieved from <https://engineering.futureuniversity.com/BOOKS%20FOR%20IT/Software-Engineering-9th-Edition-by-Ian-Sommerville.pdf>
2. Mandeep Kaur. (n.d.). *Software Project Management*. Lovely Professional University. Retrieved from https://ebooks.lpude.in/management/mba/term_4/DCAP304_DCAP515_SOFTWARE_PROJECT_MANAGEMENT.pdf