



# American International University-Bangladesh (AIUB)

## Department of Computer Science

## Faculty of Science & Technology (FST)

### Protect The Precious

A Software Engineering Project Submitted  
By

Semester: Fall_24_25		Section:F	Group Number:3	
SN	Student Name	Student ID	Contribution (CO3+CO4)	Individual Marks
1	Hasan Mahmud Shanto	22-49453-3	20%	
2	KAZIROSHID AHAMMOD ROHOLLAH	20-44203-3	20%	
3	MD.Aminul islam Sazal	22-46782-1	20%	
4	S M Abid Hasan	22-46789-1	20%	
5	Md. Hasibul Hossain	22-46605-1	20%	

The project will be Evaluated for the following Course Outcomes

<b>CO3:</b> <i>Select</i> appropriate software engineering models, project management roles and their associated skills for the complex software engineering project and evaluate the sustainability of developed software, taking into consideration the societal and environmental aspects  Appropriate Process Model Selection and Argumentation with Evidence Evidence of Argumentation regarding process model selection Analysis the impact of societal, health, safety, legal and cultural issues Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report	Total Marks	
	[5 Marks]	
	[5Marks]	
	[5Marks]	
<b>CO4:</b> <i>Develop</i> project management plan to manage software engineering projects following the principles of engineering management and economic decision process  Develop the project plan, its components of the proposed software products Identify all the activities/tasks related to project management and categorize them within the WBS structure. Perform detailed effort estimation correspond with the WBS and schedule the activities with resources Identify all the potential risks in your project and prioritize them to overcome these risk factors.	Total Marks	
	[5Marks]	
	[5Marks]	
	[5Marks]	

### Description of Student's Contribution in the Project work

Student Name: Hasan Mahmud Shanto

Student ID: 22-49453-3

Contribution in Percentage (%): 22%

Contribution in the Project:

- Background to the problem
- Functional requirement (D, E, F, O)
- Use Case Diagram
- SWE Process Model Selection
- Merging everything
- UI Design(40%)
- WBS(20%)
- Testing(30%)
- Timeline -1(40%)
- Timeline -2(30%)
- Risk management(25%)

HASAN

Signature of the Student

Student Name: KAZI ROSHID AHAMMOD ROHOLLAH

Student ID: 20-44203-3

Contribution in Percentage (%): 21%

Contribution in the Project:

- Solution to the problem
- Functional requirement (G, H, I)
- State chart diagram
- Analysis about selected model
- UI Design(5%)
- WBS(20%)
- Testing(30%)

KAZI ROSHID AHAMMOD ROHOLLAH

Signature of the Student

Student Name: MD.Aminul islam Sazal

Student ID: 22-46782-1

Contribution in Percentage (%): 19%

Contribution in the Project:

- Solution to the problem
- Functional requirement (J, K, L)
- Activity Diagram
- Roles and responsibility in selected model
- UI Design(20%)
- WBS(20%)
- Testing(20%)
- Timeline -1(20%)
- Timeline -2(20%)

- Risk management(25%)

MD.Aminul islam Sazal

\_\_\_\_\_  
Signature of the Student

Student Name: S M Abid Hasan

Student ID: 22-46789-1

Contribution in Percentage (%): 19%

Contribution in the Project:

- Solution to the problem
- Functional requirement(L, M, N)
- Activity diagram
- Roles and responsibility in selected model
- UI Design(20%)
- WBS(20%)
- Testing(20%)
- Timeline -1(20%)
- Timeline -2(20%)
- Risk management(25%)

S M Abid Hasan

\_\_\_\_\_  
Signature of the Student

Student Name: Md. Hasibul Hossain

Student ID: 22-46605-1

Contribution in Percentage (%): 19%

Contribution in the Project:

- Solution to the problem
- Functional requirement (A, B, C)
- Class diagram
- Supporting argument for model selection
- UI Design(15%)
- WBS(20%)
- Testing(30%)
- Timeline -1(20%)
- Timeline -2(20%)
- Risk management(25%)

Md. Hasibul Hossain

\_\_\_\_\_  
Signature of the Student

# **1. PROJECT PROPOSAL**

## **1.1 Background to the Problem**

Children's safety on the road has long been a major concern. Ensuring their safety is crucial, whether they're on their way to school, visiting friends, or just playing nearby. With rising traffic, unpredictable incidents, and areas lacking proper safety measures, children face risks that are worrying for parents and communities alike. Many children are exposed to critical situations, including high-traffic areas, poorly monitored zones, and even criminal activity in some neighborhoods. It's crucial to help children navigate these environments safely as they are the bright prospects of the country. While some measures are available, the need for a dedicated child safety system remains.

The core of the problem lies in the lack of proper safety measures and awareness in various spaces, where children are vulnerable to unpredictable dangers. Limited surveillance, inadequate lighting, and high-traffic zones add to the risks children face. This problem is critical because children are naïve and they deserve safe spaces to learn, play, and grow. It's our responsibility to ensure their security, helping them move around safely and giving parents peace of mind.

## **1.2 Solution to the Problem**

To provide safety to children from any kind of situation by using information technology. A mobile application connecting children and their parents. This application contains, live location information, live video and audio access, screen monitoring, automatic danger detection system, automatic notification sending system, automated protection query system which will be the key factors to ensure safety of the children.

We think it is the appropriate solution for solving Child safety on the road. This solution is unique to the market as it ensures the safety of the precious one in a different and innovative way, it has many automated system which makes the solution different from other solutions available in the market, also it offer verities of unique features that that makes it feasible enough to meet the business objectives.

The user needs to turn on the location on their device when they are out of the home. Once activated, the system will keep track of the user. If the system thinks the user is under threat, it enables the automated protection query system that will ask if the user is safe or danger situation and then instantly sends notification to all emergency contact. The system will give notification instantly (within 3 seconds) to the selective contact (5 contact). The system uses predictive analytics to choose whom the call should go to, and make sure the call goes to the best appropriate person. The system also allows parents to hear and see what their children are doing through their phone's camera and mic without them knowing it, which makes parenting way easier as they can control the surroundings of their children. Another key feature is screen monitoring. The parents can monitor what type of content their children are watching, their browsing history, set screen time for each application also for overall the whole phone, parent can also block or filter various page or application as the internet is a very vulnerable place for our little ones.

The target group of users in our solution is both Parents and children. Though children can't afford this application. So, our priority is to make the software parent based. Children are so sensitive. So, we can reduce the crime rate and increase their safety. The benefit of this application are many, Children can travel safely and are not victim of crime.

This project contributes to scientific advancements by developing a data-driven safety alert system. By classifying zones (red, yellow, green) based on real-time incident and location data, the project sets a foundation for safer route planning using location data analysis. The project's assess risk and alert contacts, contributes to research on AI applications. Additionally, its privacy-focused design promotes ethical standards in safety technology, and documented methodologies offer valuable resources for replicability in future safety studies. Other features like screen monitoring helps the internet to grow safely as it is a very vulnerable place for children.

Existing studies on road safety for children have focused on risk-based and alert systems, but often lack real-time responsiveness and a child-centered approach. Our project builds on these zone-based classifications with live alerts, specifically designed for children's safety. It not only avoids high-risk areas but also actively notifies emergencies and prompts user safety checks, providing a comprehensive, proactive safety solution that enhances existing approaches. Moreover, this app will be more focused on security, sensitivity and integrity for the users which set us apart from other applications.

There are few applications on the same ideas, such as,

**Life360:** <https://www.life360.com/location-sharing/>

Life360 is primarily a family tracking app that allows parents to monitor their children's locations through GPS. However, it doesn't actively categorize areas into risk zones or account for real-time safety features like environmental analysis.

**Find my kids:** <https://play.google.com/store/apps/details?id=org.findmykids.app&hl=en>

Find My Kids is a family live GPS tracker designed for child safety and mental health. Parents can connect to a child's GPS watch or install the app for live location sharing. However, it does not actively categorize areas based on criminal activities or safety.

**Kids 360:** <https://play.google.com/store/apps/details?id=app.kids360.parent&hl=en>

Kids360 is a parental control app that limits screen time, tracks app usage, and offers educational games. It includes an app usage limiter, scheduling, and app statistics, but lacks risk zone categorization and real-time safety features.

**FlashGet kids: parental control:**

<https://play.google.com/store/apps/details?id=com.flashget.parentalcontrol&hl=en>

FlashGet Kids is a parental control app that allows parents to monitor their child's location and online activities. Key features include content management, live location tracking with geo-fencing alerts, remote camera access, and one-way audio. However, it does not include risk zone classification based on safety data.

**FamiSafe:** <https://play.google.com/store/apps/details?id=com.wondershare.famisafe&hl=en>

FamiSafe is a comprehensive parental control app that includes features for monitoring online activities, location tracking, screen time control, and content filtering. While it offers some monitoring capabilities, it does not provide advanced risk zone alerts or audio surveillance features.

**KidSlox:** <https://play.google.com/store/apps/details?id=com.kidslox.app&hl=en>

KidSlox is a parental control app that helps manage screen time and monitor location. It focuses primarily on-screen time management and app blocking but lacks proactive safety features such as risk zone alerts and real-time audio monitoring.

So, many of these applications lack our technology, where we are providing live classification of your area based on recent criminal records and reviews also based on the overall safety measure. Also, many of these applications are manually controlled, which might be missed sometimes by the parents. This is where we innovated to automatic system where the system acts on its own to make decisions and notify the respective parties.

## **2. SOFTWARE DEVELOPMENT LIFE CYCLE**

### **2.1 Process Model:**

In this model the Scrum Model is used. The reason for choosing this model is that the requirement of this project is not stable. Moreover, the project is a large project which is suitable for using the scrum model.

Scrum provides a completely well-organized structure consisting of Pregame, Development, and Post game phase. Which is perfectly suited for our program, as we are looking to develop software which has complex functionalities, has potential to future changes in requirements, requires collaboration with the customers, requires proper documentation and teamwork, requires daily meeting, backlogging and collaboration of the team. Regarding all these factors, scrum is the most feasible option for our software.

Scrum is progressive due to it being change-aware and collaborative. As opposed to the Waterfall methodology, which is described by strict phases (of requirements, design, implementation, testing, and deployment) that progress in a linear fashion with no backward movement, Scrum can be modified even during development. This is very relevant to your project, for example, "Protect the Precious", where there may be new demands. Sufficiency of changes that can be introduced at previous stages makes the Waterfall model inappropriate for changing the requirements for the project in scope. Likewise, the V-Model puts more stress on verification and validation through its focus on development and testing completed in parallel, it does not provide an iterative approach like the Scrum. It is worth mentioning that the V-Model is quite rigid and is best suited for systems of critical importance to safety or quality of deliverables but suffers from changes in requirements very often which is the case when dealing with design projects like yours. In contrast, Scrum embeds testing within all sprints, providing the developers with timely QA and allowing problems like false alarms and privacy issues in your application to be flagged early on. Compared to other iterative models like DSDM, XP, FDD, and Incremental Model, in Scrum there is more organization and collaboration. DSDM also has timeboxes and user involvement as its focus but has a disadvantage of giving utmost importance to time making feature prioritization a bit inflexible. Thanks to Scrum's iterative nature of sprints and the product backlog, your team can perform activities that involve placing priority on essential features, such as installing the automated alerts and emergency calling features. XP also advocates regular technical development and timely delivery but such developments such as pair programming require a lot of discipline and may not be relevant to your line of work. FDD is iterative in nature, but it focuses a lot on completing the specified features without wider avenues of interaction with other processes or stakeholders as is the case in Scrum. The Incremental Model and Prototyping Model share similarities with Scrum in their iterative nature but differ in their approach. The Incremental Model delivers the software in parts, with each increment building onto the previous one. However, changes to earlier increments can be difficult, making them less adaptable than Scrum. The Prototyping Model, while excellent for projects with unclear requirements, focuses primarily on creating early prototypes for feedback. This approach may not provide the continuous improvement and structured team collaboration needed for your project. Finally, Scrum's collaborative nature aligns perfectly with your team-based project structure. Daily stand-ups, sprint planning, and retrospectives promote teamwork and ensure smooth communication across all contributors. This contrasts with the siloed work environments common in models like Waterfall or V-Model. By choosing Scrum, your team can deliver a dynamic, high-quality application that evolves in response to real-world needs, making it the ideal choice for "Protect the Precious."

## 2.2 Project Role Identification and Responsibility

### i. Scrum Master

- **Role:** Guides the team and ensures Scrum rules are followed.
- **Responsibilities:**
  - Runs meetings like Sprint Planning and Daily Scrum.
  - Helps the team solve problems, like issues with live location or safety alerts.
  - Make sure the team stays on track.

### ii. Product Owner

- **Role:** Manages the features and priorities for the app.
- **Responsibilities:**
  - Decides what to build first, like emergency alerts or child monitoring.
  - Updates the task list (Product Backlog) based on user feedback.
  - Works with parents, children, and stakeholders to define the app's needs.

### iii. Scrum Team

- **Role:** Builds the app features and tests them.
- **Responsibilities:**
  - Develop features like map zones, panic buttons, and automated calls.
  - Fixes issues and deliver updates in short cycles (Sprints).
  - Collaborate daily to track progress and solve issues.

### iv. Stakeholders

- **Role:** Give feedback and support the project.
- **Responsibilities:**
  - Parents and children test the app and suggest improvements.
  - Management approves resources and supports development.



### 3. FUNCTIONAL REQUIREMENTS

#### A. Registration:

##### Functional Requirements:

- Software will allow users to register with either their phone number or email address.
- After the first step is successful, the software will collect user data (Name, Profile picture (must be shown his face), Password, Username, Date of Birth, Gender, Address, Parent and children information etc.).
- Software compels users to create secure passwords, consisting of 8 digits where there should be at least an uppercase, at least a lower case also it must include a special symbol and a number digit.
- The software will issue a 4-digit verification code in the provided email or phone number if all the stages have been followed.
- Databases will be used to store the sign-up information, including login, password, and email address.

**Priority level:** High.

**Precondition:** The user should have a valid email address or a valid phone number, valid password, valid username, proper profile picture.

#### B. Login:

##### Functional Requirements:

- Users may log in to the software using their provided username and password.
- The username and password used for login will be compared to database records.
- If the login process is successful, the home page will be shown.
- The system shall restrict the user profile login to thirty minutes if the number of login attempts exceeds its limit (three times).

**Priority level:** High.

**Precondition:** The user must have a Username and Password.

#### C. Forget Password:

##### Functional Requirements:

- Users need to provide the exact same email/phone number, which was added to the account during registration, to recover the account.
- If the entered email address is valid, send an email with a reset link to it.
- Reset link provides a temporary password to identify the user account and save its information.

- When the password is reset, it returns to login page

**Priority level:** High.

**Precondition:** The user must register with Phone No./Gmail.

#### D. Map:

##### Functional Requirements:

- This system will display a map on both children's and parents' ends.
- The map highlights nearby police stations.
- The system will categorize the locations into 3 categories, such as red zone, Yellow zone and Green zone. based on recent criminal activities, traffic records, population records and reviews from other users.
- Red zone consists of zones that are highly prone to criminal activities and the yellow zones are moderately prone and green zones are the safest of them all.
- The map will directly connect with google map so user must need a google account
- This feature highly relies on location so, the users must turn on locations beforehand using this

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials and location is turned on.

#### E. Live Location Sharing:

##### Functional requirements:

- The live location of the users will be shared with the selective users.
- This feature requires the users to turn their location on, so users must turn on location beforehand using this feature
- This live location will be shared on maps.
- In parents end they can check up on their children where they are in live time using this

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials and location is turned on.

## **F. Automated protection queries and danger**

### **detection:**

#### **Functional requirements:**

- If the system detects that the user is in a red zone it automatically asks if they are safe or not.
- The system asks 3 times and gives them sufficient time to answer
- The system also detects unusual activities such as, going to somewhere the user wasn't supposed to go, turning off location, deactivating the app, and going to red and yellow zones.
- The system always asks beforehand considering that the user is in danger.

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials and location is turned on.

## **G. Automatic calling and notification s**

### **Functional requirement:**

- If system Detect any unusual Gesture movement Automatic notification will be active and send a notification to parents.
- After sending notification, the system will call trusted contact (5 contact if 1<sup>st</sup> one misses the call).
- The system will call the nearest police station (999 if police station is far from situation place).

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials and the location is turned on also they had set up proper emergency contracts.

## **H. Panic button:**

### **Functional requirements:**

- User can Click on screen panic button for instant turning on automatic calling system.
- If the users unintentionally press the button press the stop button and enter hir user password within 30 seconds.
- After pressing the button, the system automatically finds the location of the users and informs the police.

**Priority level:** Medium.

**Precondition:** The user must create a valid account and login with valid credentials and the location is turned on also they had set up proper emergency contracts.

**I. Emergency Contact:**

**Functional requirements:**

- Users can add Five emergency contact numbers from their relatives (Father > Mother > Elder Brother/sister > Uncle > relatives)
- Users must provide a valid contact number.
- The system will check the number to see if it is correct or not and send a notice if it is.
- Users can also update emergency contact if needed.  
(User Must enter his/her password after editing contact).
- The system will send a verification code to the user's given number to verify.

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials.

**J. Profile page:**

**Functional requirements**

- They can edit their Information (name, username, password, etc.) here.
- Users can edit their previous reports on activities.
- They can change the theme as well.
- They can add, edit and delete the emergency contacts.

**Priority level:** Medium.

**Precondition:** The user must create a valid account and login with valid credentials.

**K. Daily destinations:**

**Functional requirements**

- Users can set their daily destinations they will visit beforehand leaving their homes.
- If the user goes to a place that he is not supposed to go, then the system will trigger the Automated protection system

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials and location is turned on.

## **L. Child Monitoring**

### **Functional requirements**

- Parents can keep track of their child's browsing history.
- Parents can watch their screen live.
- Parents can have a report of their child's total screen time, which apps they are using the most etc.
- It also sends an alert note to parents if the child goes to place on internet where he is not supposed to go.

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials and the parent's account is connected with child's account.

## **M. Live video & audio**

### **Functional requirements**

- parents can start video and audio streaming remotely when concerned.
- Parents can talk and see directly to the child through the audio and video feature.
- Both video and audio are securely recorded and stored for future reference.
- Access to the live stream is restricted to authorized individuals (parents or guardians) to protect the child's privacy.

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials and the parent's account is connected with child's account.

## N. **Restricting Usage**

### **Functional requirements:**

- Parents will be able to set a restriction for any website.
- Will be able to set time for kids how much time they will play games or do other multimedia activities.
- By using this app parents can set timer for using phone. (after 11 am phone will automatically lock)
- Parents can restrict social media uses for their kids as well.

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials and the parent's account is connected with child's account.

## O. **Last Location:**

### **Functional Requirements:**

- If somehow the users' locations turn off or maybe they are having a bad network or their phone turns off connection then the system tracks their last activities, visited areas.
- A report is also then sent to the respected parents.

**Priority level:** High.

**Precondition:** The user must create a valid account and login with valid credentials.

## 4. UML DIAGRAM

### 4.1 Use Case Diagram:

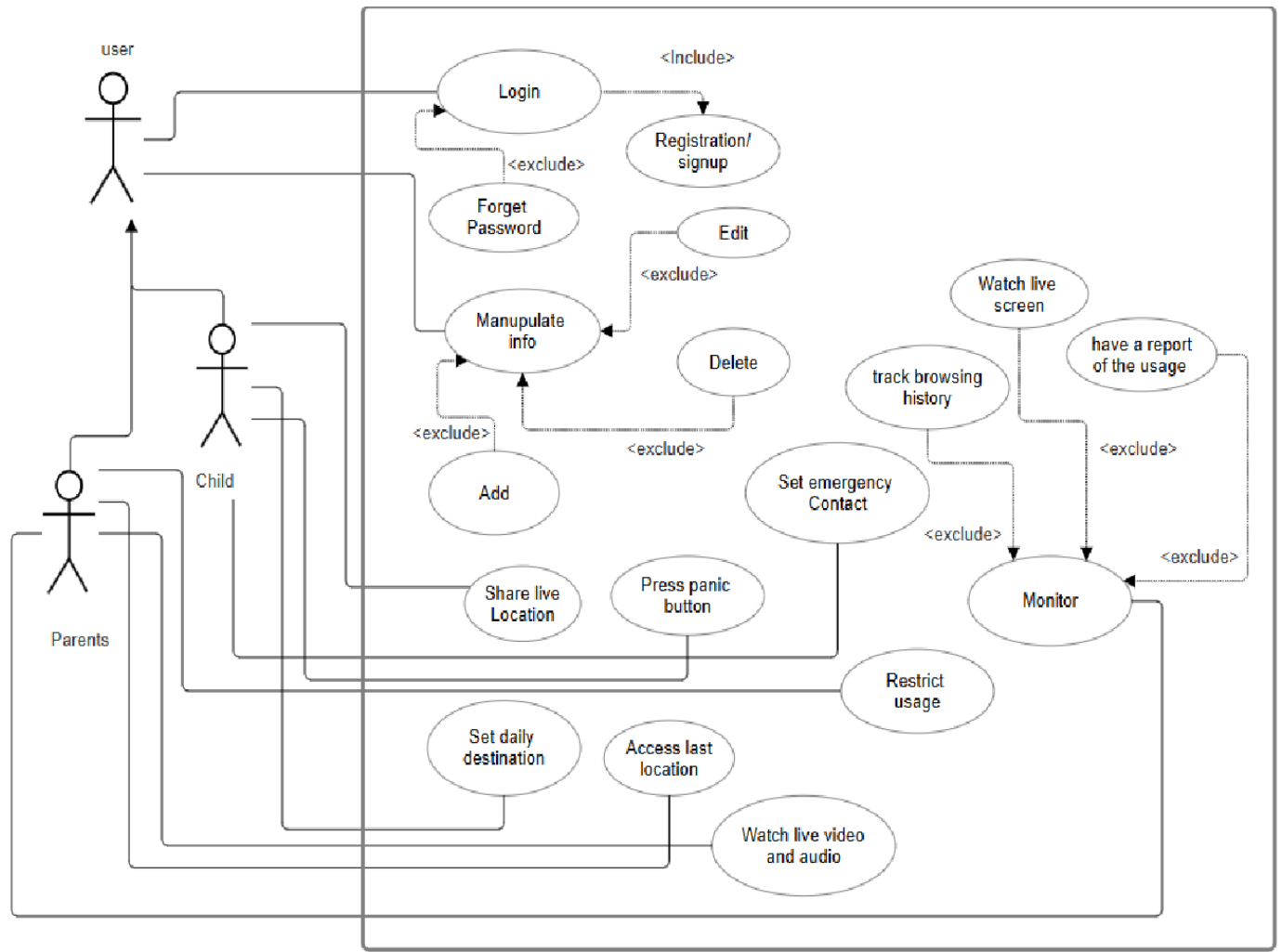


Fig 1: Use case diagram

## 4.2 Class Diagram

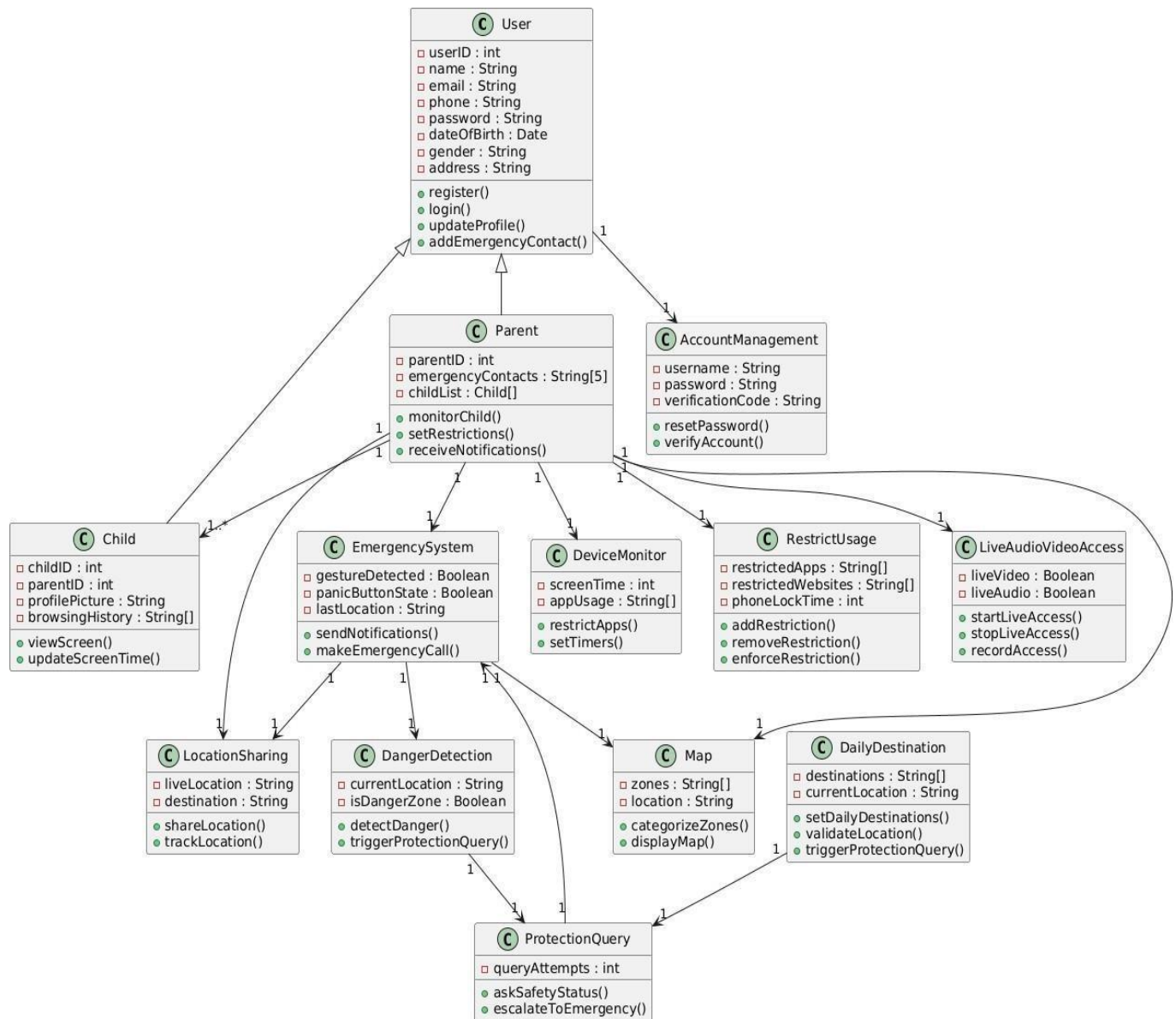


Fig 2: Class diagram



### 4.3 Activity Diagram

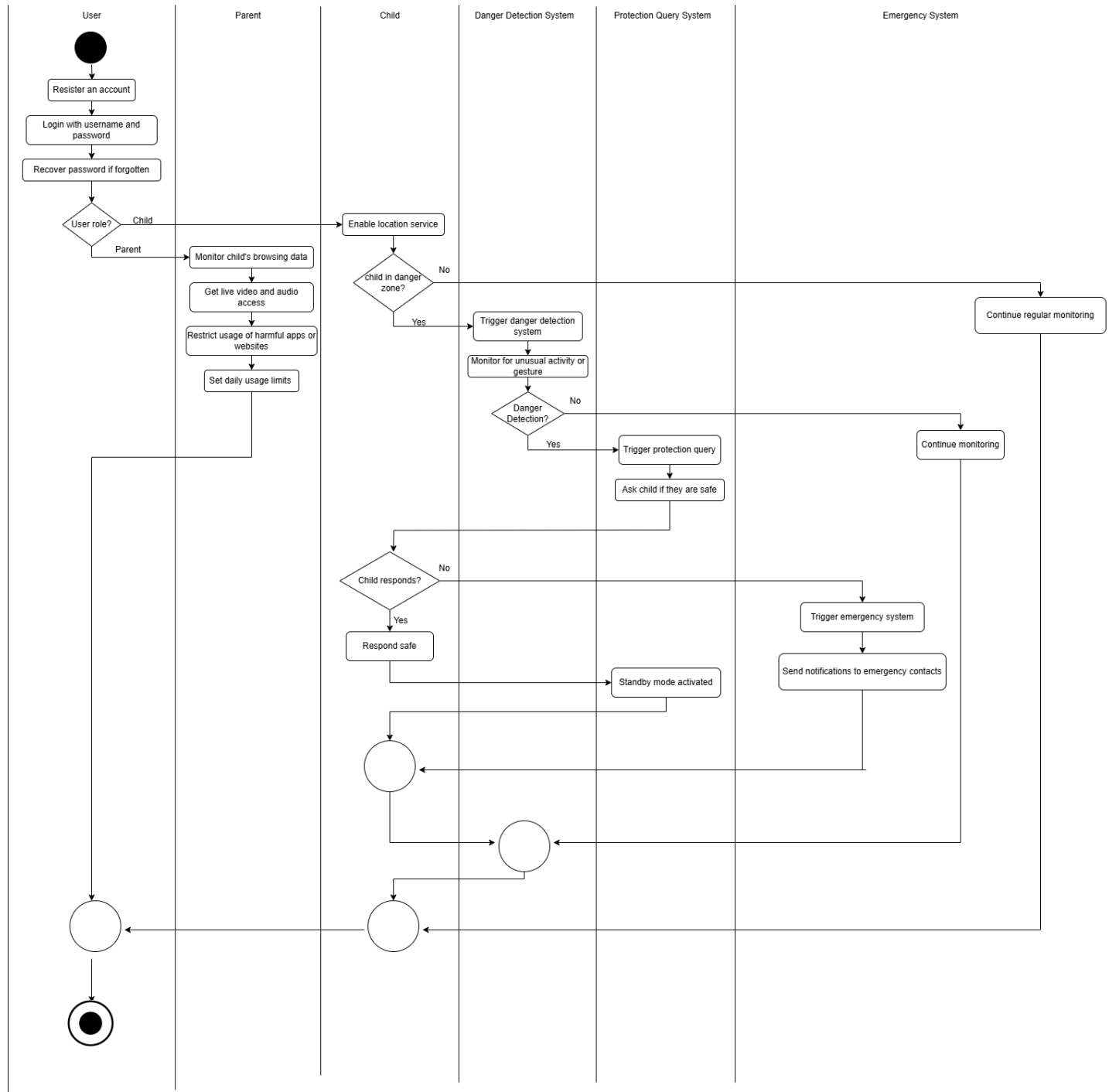


Fig 3: Activity diagram

## 4.4 State Chart Diagram



Fig 4: Sequence diagram

5. UI Design:



Fig 5: Login choice.

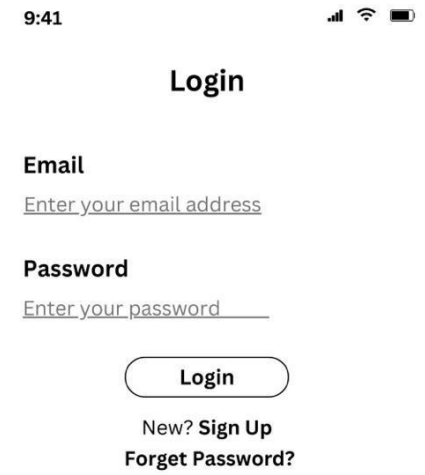


Fig 6: Login page

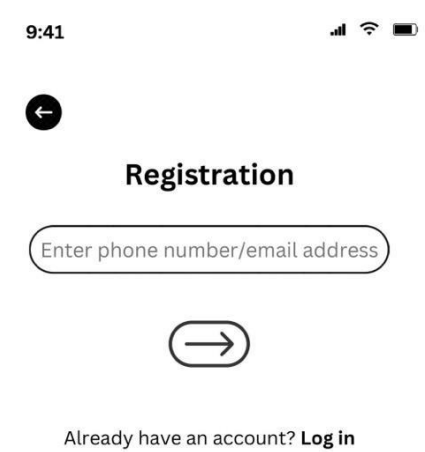


Fig 7: Registration page-1

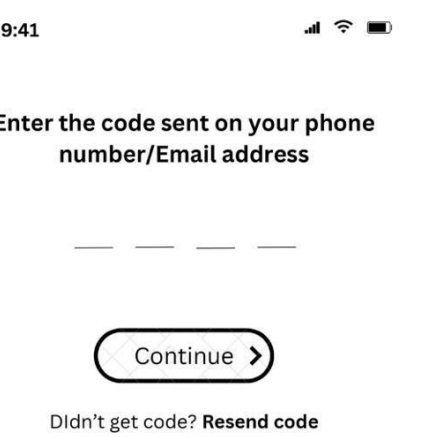


Fig 8: Registration page-2

9:41



## Upload profile picture



Continue >

Fig 9: Registration page-3

9:41



## Registration

Account Type

Choose type ▶

Name

Date of Birth

DD/MM/YY

Gender

Choose gender ▶

Address

Password

Re-type password

Next >

Fig 10: Registration page-4

9:41



## Forget Password

Enter phone number/email address



Already have an account? **Log in**

Fig 11: Forget password-1

9:41



Enter the code sent on your phone  
number/Email address

— — — —

Continue >

Didn't get code? **Resend code**

Fig 12: Forget password-2

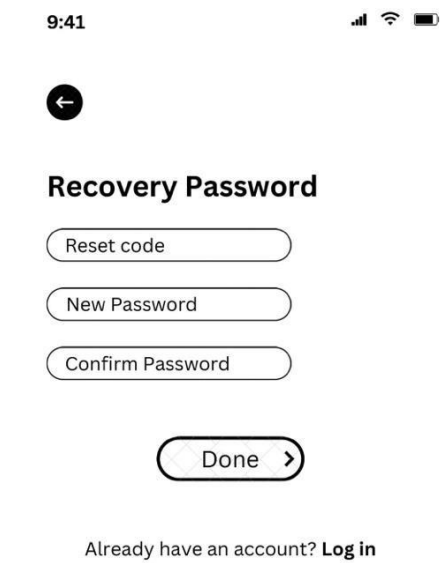


Fig 13: Forget password-3

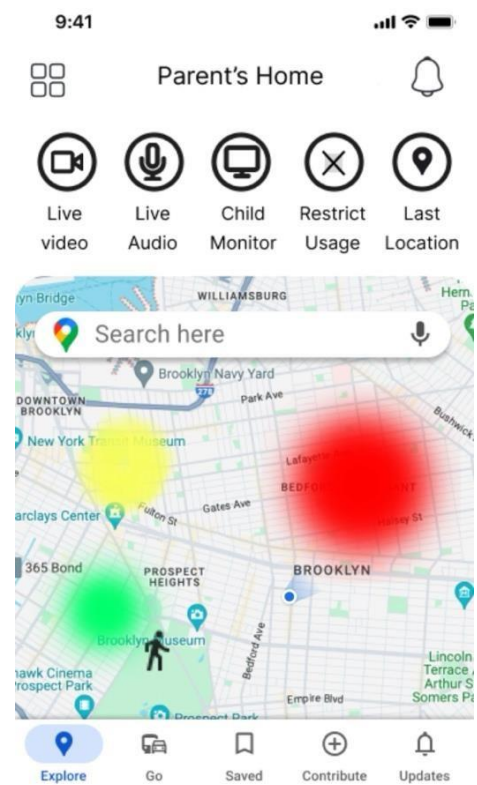


Fig 14: Parents Home

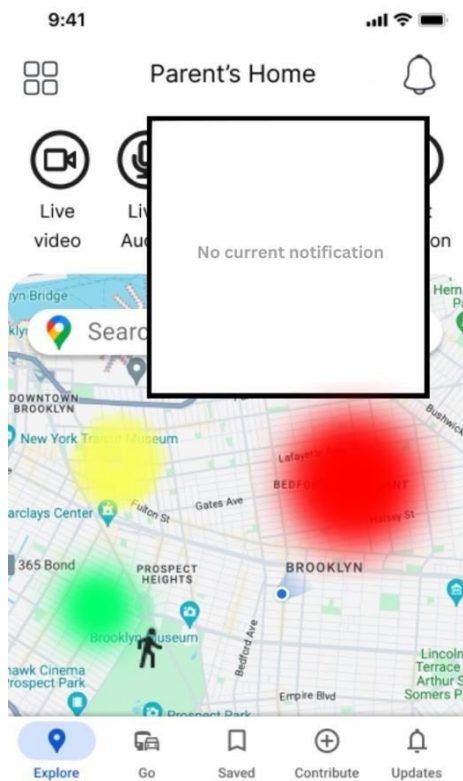


Fig 15: Notification box (No notification)

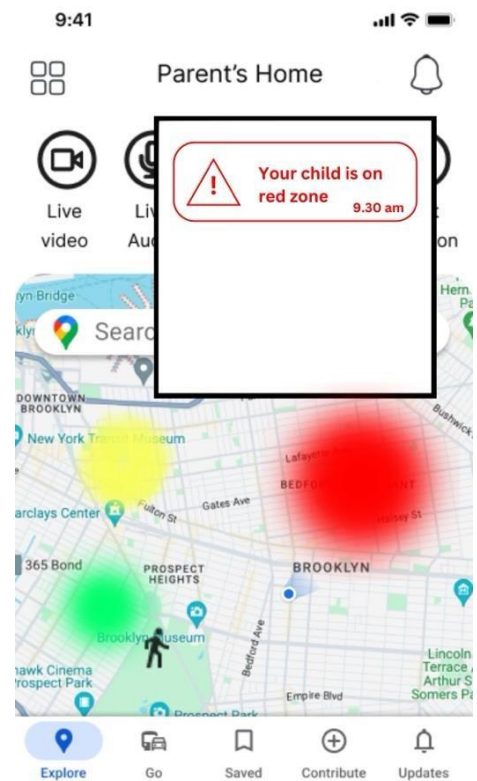


Fig 16: Notification box (with notification)

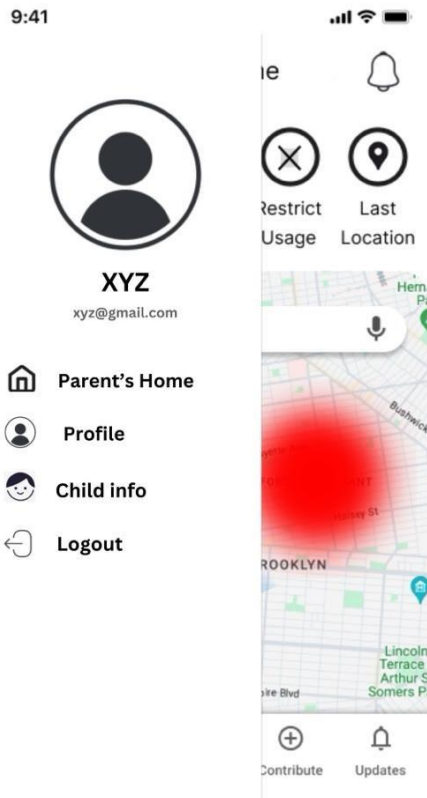


Fig 17: Parent's Sidebar



Fig 18: Parent's Profile

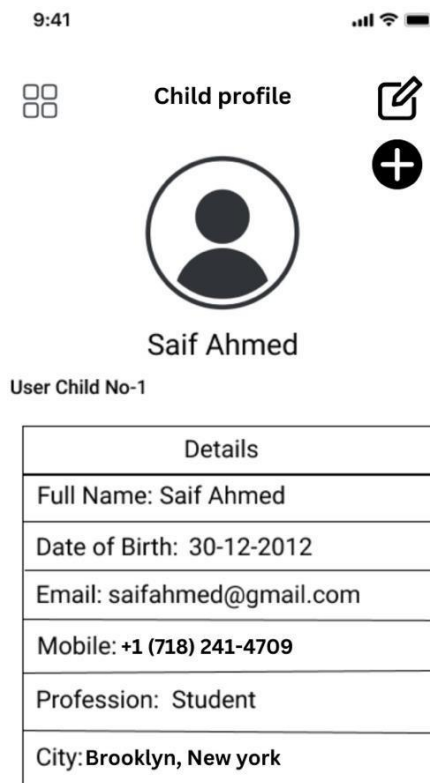


Fig 19: Child's info

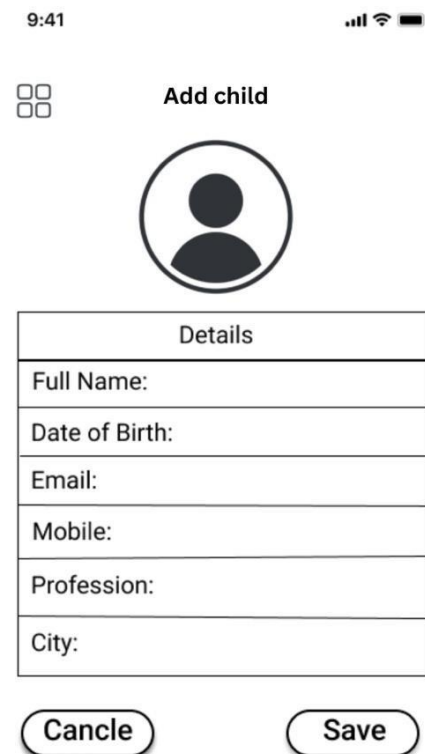


Fig 20: Add Child

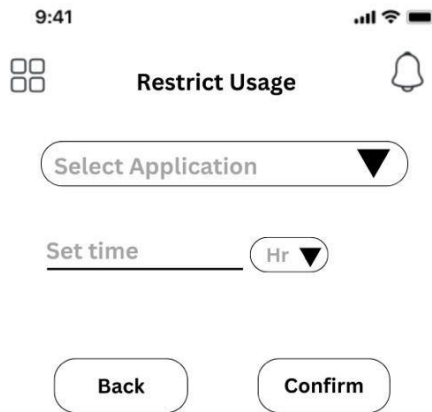


Fig 21: Restrict Usage-1

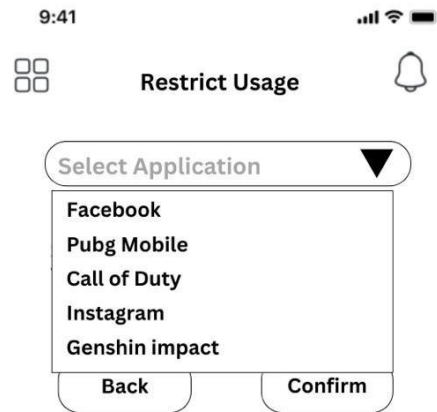


Fig 22: Restrict usage-2

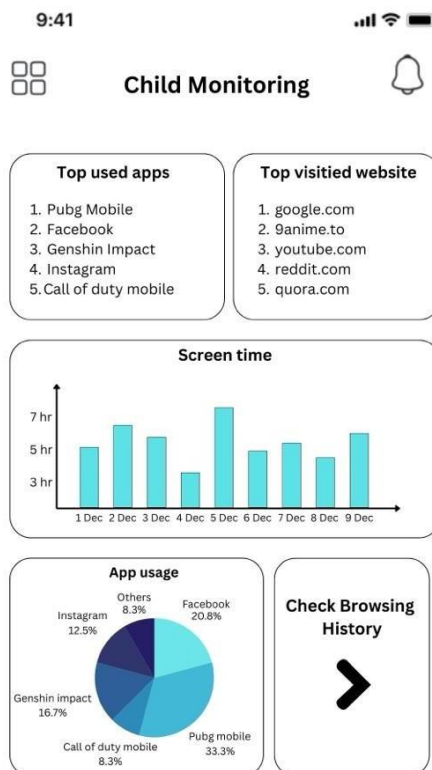


Fig 23: Child monitoring



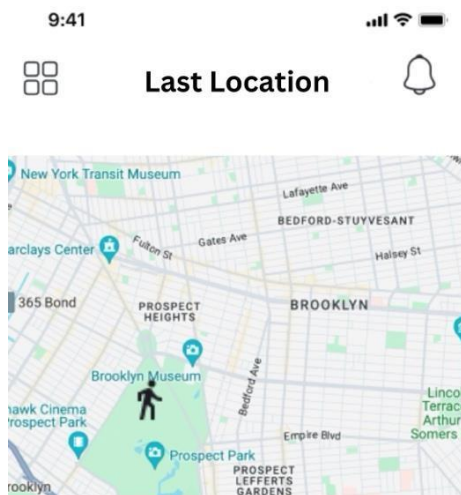
Fig 24: Child's browsing history



Fig 25: Live audio of child



Fig 26: Live video of child



The last visited location is Brooklyn Museum

Fig 27: Last location

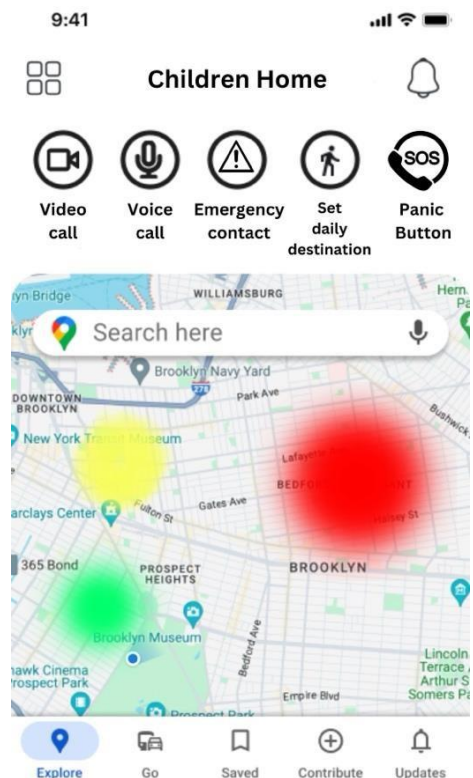


Fig 28: Children's homepage



9:41



XYZ  
xyz@gmail.com

Child's Home

Profile

Logout

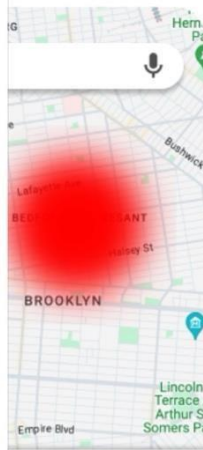
Home



Set daily destination



Panic Button



Contribute



Updates

Fig 29: Children's sidebar

9:41



Child profile



Saif Ahmed

Details
Full Name: Saif Ahmed
Date of Birth: 30-12-2012
Email: saifahmed@gmail.com
Mobile: +1 (718) 241-4709
Profession: Student
City: Brooklyn, New york

Fig 30: Children profile

9:41



Children Home



Video call



Voice call



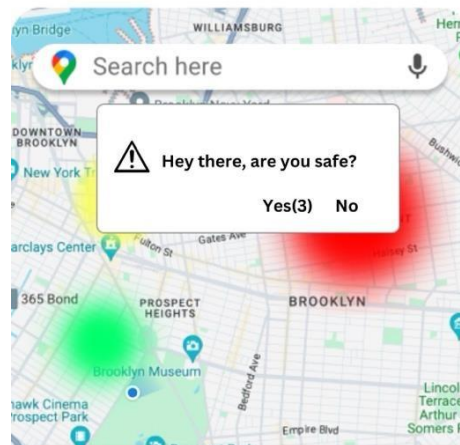
Emergency contact



Set daily destination



Panic Button



Explore

Go

Saved

Contribute

Updates

Fig 31: SOS button pressed



Fig 32: Emergency Contacts



Fig 33: Add emergency contacts

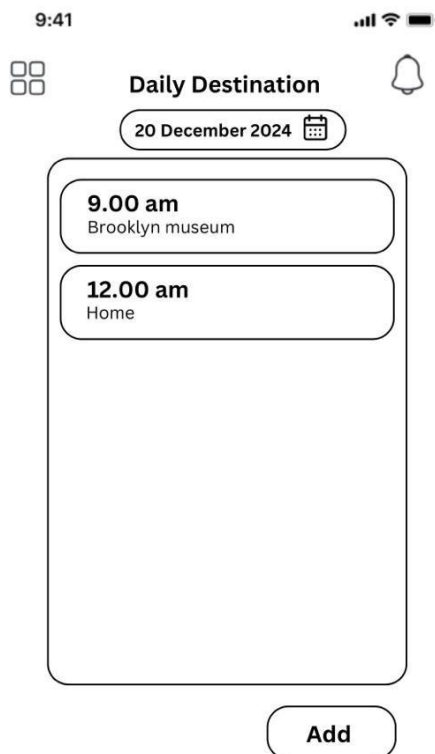


Fig 34: Daily Destination

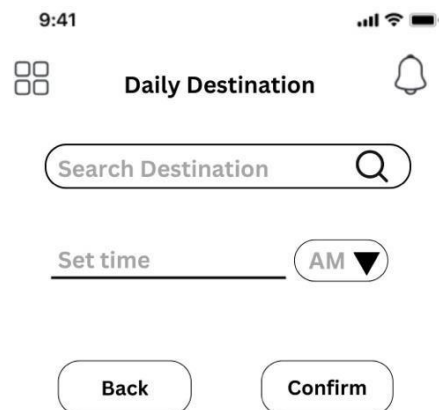


Fig 35: Add daily destination

## 6. Work Breakdown Structure (WBS):

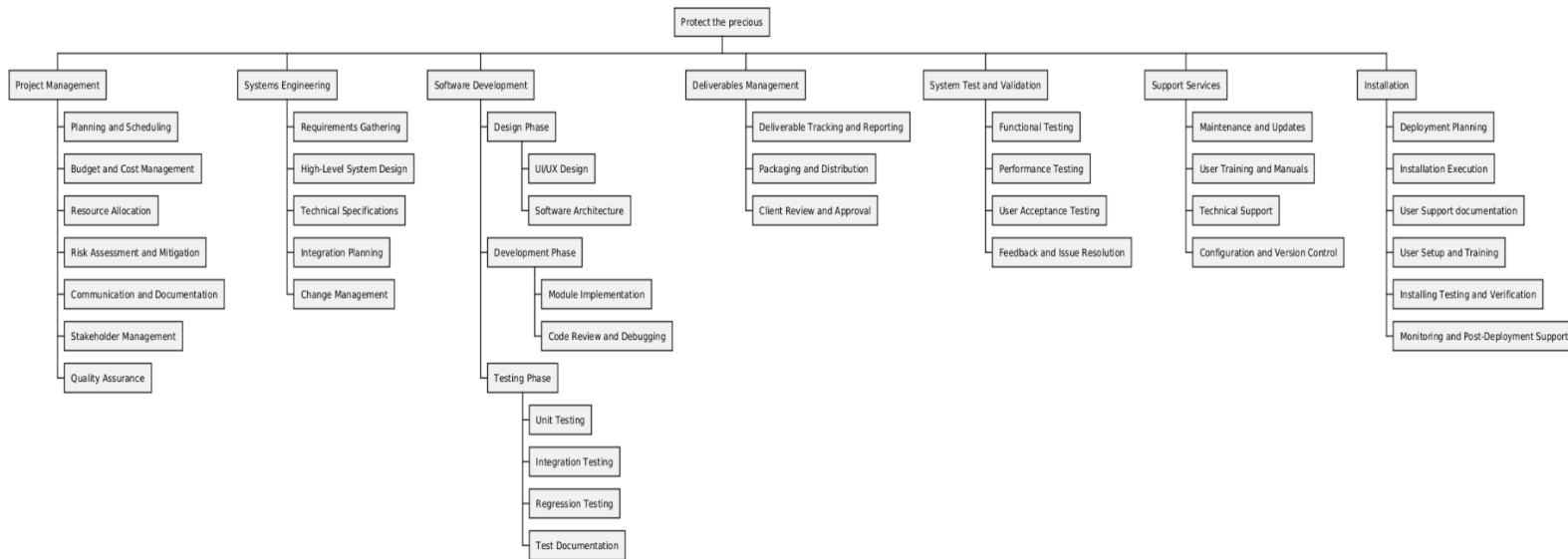


Fig 35: Work breakdown Structure

## 7. Software Testing:

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_A		Test Designed date:		
Test Priority: High		Test Executed by:		
Module Name: Registration		Test Execution date:		
Test title: User Registration				
Description: Allow users to register with their details.				
Precondition: The user must have a valid email address or phone number, a secure password, a valid username, and an appropriate profile picture.				
1. <b>Test Steps:</b> Open the app.	<b>Test Data:</b> Enter valid registration details (e.g., valid email, phone number, strong password).	<b>Expected Results</b> User registration should be successful.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_B		Test Designed date:		
Test Priority: High		Test Executed by:		
Module Name: Login		Test Execution date:		
Test title: User Login				
Description: Allow users to log in using valid credentials.				
Precondition: The user must have a registered username and password.				
<b>Test Steps:</b> Enter the registered username and password > Click the "Login" button.	<b>Test Data:</b> Valid username and password.	<b>Expected Results</b> User should be redirected to the home page on successful login. Incorrect attempts should restrict login for 30 minutes after 3 failed attempts.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_C		Test Designed date:		
Test Priority: High		Test Executed by:		
Module Name: Forget Password		Test Execution date:		
Test title: Password Recovery				
Description: Allow users to recover their password using their email or phone number.				
Precondition: The user must have registered with a valid email address or phone number.				
<b>1. Test Steps:</b> Navigate to the "Forget Password" page.>> Enter the email or phone number associated with the account. Click "Submit."	<b>Test Data:</b> Registered email or phone number.	<b>Expected Results</b> A password reset link should be sent to the email. >>>The new password should allow login after successful reset.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

Project Name: Protect the precious		Test Designed by:			
Test Case: FD_D.1		Test Designed date:			
Test Priority: HIGH		Test Executed by:			
Module Name: Map		Test Execution date:			
Test title: Map searching					
Description: Test the searching ability of the map					
Precondition: must create a valid account and login with valid credentials and location is turned on					
Test Steps: 1. Go to home page. 2. Search for any place on the map 3. Click the search button		Test Data: Search Item: Queens, New York.	Expected Results:  Show a dropped pin on Queens in the map	Actual Results:	Status (Pass/Fail):

Project Name: Protect the precious		Test Designed by:			
Test Case: FD_D.2		Test Designed date:			
Test Priority: HIGH		Test Executed by:			
Module Name: Map		Test Execution date:			
Test title: Map Direction					
Description: Test the direction giving ability of the map					
Precondition: must create a valid account and login with valid credentials and location is turned on					
Test Steps: 1. Go to home page. 2. Search for Direction to any place on the map 3. Click the search button		Test Data: Search Item: Queens, New York.	Expected Results:  Considering the red, yellow, green zone, show a safe and optimal path dropped pin on Queens in the map	Actual Results:	Status (Pass/Fail):

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_D.3		Test Designed date:		
Test Priority: HIGH		Test Executed by:		
Module Name: Map		Test Execution date:		
Test title: Map zone creation				
Description: Test the ability of the map to categorize it into red, yellow and green zones.				
Precondition: must create a valid account and login with valid credentials and location is turned on				
Test Steps: 1. Go to home page. 2. Check the map	Test Data: Nothing	Expected Results: Categorize into red, yellow and green zones	Actual Results:	Status (Pass/Fail):

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_E		Test Designed date:		
Test Priority: HIGH		Test Executed by:		
Module Name: LocationSharing		Test Execution date:		
Test title: Live location sharing				
Description: Test the ability to share real time locations of the children to the parent				
Precondition: must create a valid account and login with valid credentials and location is turned on in children's end				
Test Steps: 1. Go to parents' home page. 2. Check the map 3. Look for the live location of the child	Test Data:	Expected Results:  Show a real time location of the child	Actual Results:	Status (Pass/Fail):

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_F		Test Designed date:		
Test Priority: HIGH		Test Executed by:		
Module Name: Protection Query		Test Execution date:		
Test title: Automated protection query				
Description: Test the ability of the system to detect danger and activate automated protection system				
Precondition: must create a valid account and login with valid credentials and location is turned on				
Test Steps: 1. Go to home page. 2. While the location is on go to some place which is under red zone.	Test Data:	Expected Results:  Activate the automated protection system	Actual Results:	Status (Pass/Fail):

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_G		Test Designed date:		
Test Priority: HIGH		Test Executed by:		
Module Name: Emergency System		Test Execution date:		
Test title: Automatic calling and notifications				
Description: Test the searching ability of the map				
Precondition: must create a valid account and login with valid credentials and location is turned on				
Test Steps: 1. Go to home page. 2. Activate emergency system.	Test Data:	Expected Results: Contact the respected parent of a specific user while in emergency mode,	Actual Results:	Status (Pass/Fail):

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_H		Test Designed date:		
Test Priority: Medium		Test Executed by:		
Module Name:		Test Execution date:		
Test title: Panic Button				
Description: Active by clicking on screen button				
Precondition: The user must create a valid account and login with valid credentials and the location is turned on also they had set up proper emergency contracts.				
<b>Test Steps:</b> Home > tap Panic button (right side)	<b>Test Data:</b> click and check if it activates the automatic Protection system.	<b>Expected Results</b> Automated protection System will active.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_I		Test Designed date:		
Test Priority: High		Test Executed by:		
Module Name:		Test Execution date:		
Test title: Emergency Contact				
Description: user will add 5 Contact for emergency				
Precondition: The user must create a valid account and login with valid credentials.				
<b>Test Steps:</b> Home > Click on side bar on left > emergency contact	<b>Test Data:</b> Nothing	<b>Expected Results</b> After Activating the Automated Protection system the system will start contacting emergency contacts.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)



Project Name: Protect the precious		Test Designed by:		
Test Case: FR_J (1)		Test Designed date:		
Test Priority: Medium		Test Executed by:		
Module Name:		Test Execution date:		
Test title: Profile page				
Description: User can edit their Information.				
Precondition: The user must create a valid account and login with valid credentials.				
<b>Test Steps:</b> Home > Side bar button (left side) > profile > edit.	<b>Test Data:</b> click and edit some info (Contact, DOB, Address etc.)	<b>Expected Results</b> Can edit information's.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_J (2)		Test Designed date:		
Test Priority: Medium		Test Executed by:		
Module Name:		Test Execution date:		
Test title: Profile page				
Description: User can See their Information.				
Precondition: The user must create a valid account and login with valid credentials.				
<b>Test Steps:</b> Home > Side bar button (left side) > profile.	<b>Test Data:</b> check All Information.	<b>Expected Results:</b> User Can see their All info here.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_K		Test Designed date:		
Test Priority: High		Test Executed by:		
Module Name:		Test Execution date:		
Test title: Daily destinations				
Description: User can set their all Destinations They want to visit beforehand Leaving their home.				
Precondition: The user must create a valid account and login with valid credentials and location is turned on				
<b>Test Steps:</b> Home > Set daily Destinations	<b>Test Data:</b> Set locations where user wants to visit.	<b>Expected Results:</b> User will see map suggestion for his/her destination.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_L		Test Designed date:		
Test Priority: Medium		Test Executed by:		
Module Name: Child Monitoring		Test Execution date:		
Test title: Monitor Child Activities				
Description: Track browsing history, screen usage, and provide alerts				
Precondition: Parent account must be connected to child account..				
1. <b>Test Steps:</b> Connect parent and child accounts. 2. Access browsing history.	<b>Test Data:</b> Browsing activity and restricted website URL.	<b>Expected Results</b> Browsing history is displayed, and alerts are sent for restricted website attempts.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_M		Test Designed date:		
Test Priority: High		Test Executed by:		
Module Name: Live Video C Audio		Test Execution date:		
Test title: Stream Live Video and Audio				
Description: Allow parents to remotely access live video and audio streams of their child.				
Precondition: Parent account must be connected to child account.				
1. <b>Test Steps:</b> Start live video and audio streaming. 2. Verify video and audio clarity.	<b>Test Data:</b> Video and audio stream request	<b>Expected Results</b> The live stream is clear and restricted to authorized individuals.	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

Project Name: Protect the precious		Test Designed by:		
Test Case: FR_N		Test Designed date:		
Test Priority: High		Test Executed by:		
Module Name: Restricting Usage		Test Execution date:		
Test title: Set Usage Restrictions				
Description: Restrict access to specific websites, apps, or phone usage time.				
Precondition: Parent account must be connected to child account.				
1. <b>Test Steps:</b> Set a restriction on a website. 2. Attempt to access the restricted website.	<b>Test Data:</b> Restricted website URL.	<b>Expected Results</b> Access to the restricted website is blocked, and a notification is sent to the parent	<b>Actual Results</b>	<b>Status</b> (Pass/Fail)

## 8. Effort Estimation and Scheduling:

### Timeline-1:

Considering, source line of code = 8000,

$$Effort = PM = Coefficient_{<Effort Factor>} \times \left(\frac{SLOC}{1000}\right)^P = 2.4 \times \left(\frac{6000}{1000}\right)^{1.05} = 15.749$$

$$Development\ time = DM = 2.50 \times (PM)^T = 2.50 \times (15.749)^{0.38} = 7.127\ months$$

$$required\ weeks = 7.127 \times 4 = 28.508 \approx 28\ weeks$$

$$required\ number\ of\ people = ST = \frac{PM}{DM} = \frac{15.749}{7.127} = 2.21 \approx 3$$

So, 3 people will be needed, They are Adolf, Stalin and Lenin

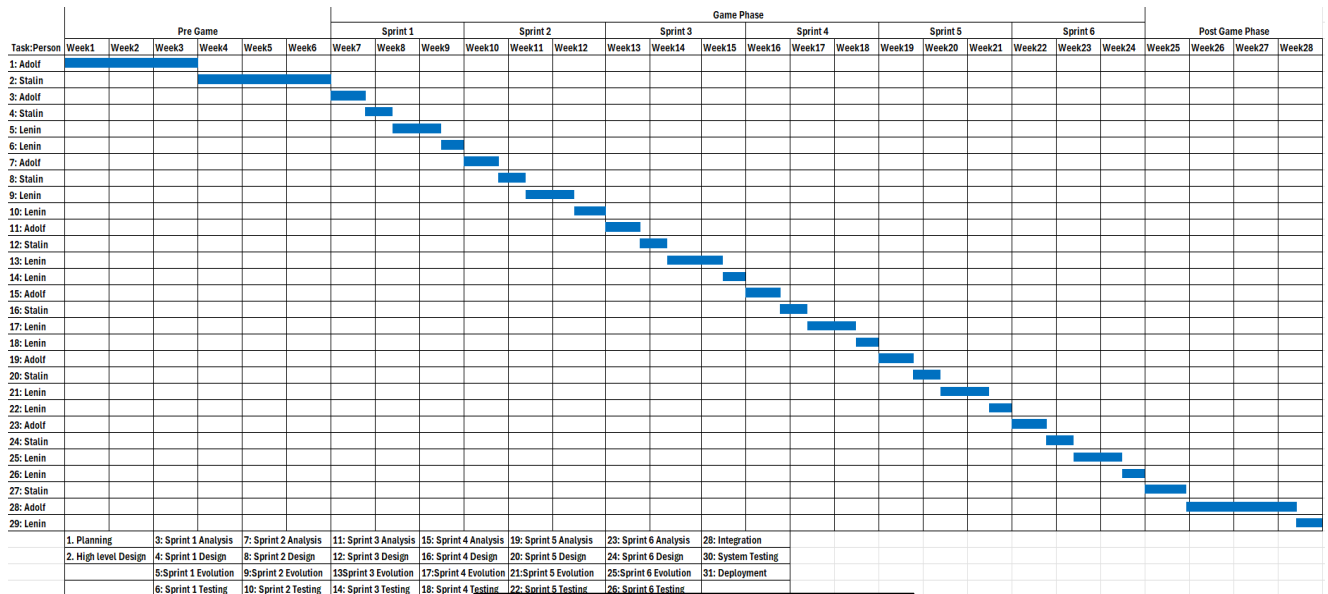


Fig 36: Timeline - 1

### Timeline-2:

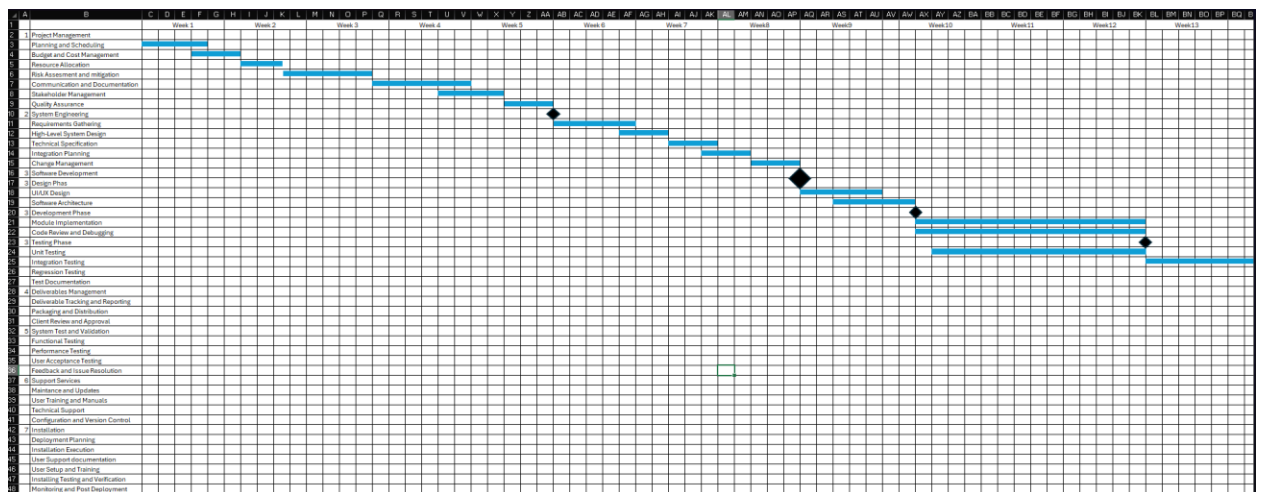


Fig 37: Timeline-2

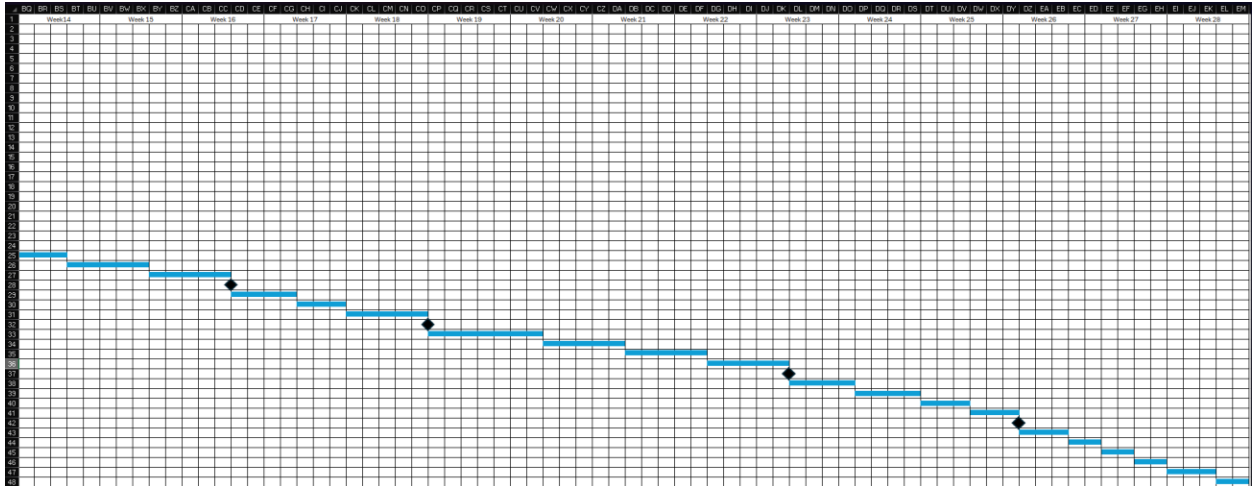


Fig 38: Timeline -2

### Earned Value Analysis (EVA):

Task	Planned Effort	Actual Effort
1	5.0	2.0
2	8.5	5.5
3	3.0	5.0
4	2.0	4.5
5	5.5	5.5
6	2.5	3.0
7	4.5	4.0
8	9.0	7.0
9	1.0	-
10	3.5	-

$$BAC = 28 \times 5 = 140 \text{ person days}$$

$$SPI = \frac{BCWP}{BCWS} = \frac{40}{44.5} = 0.8989$$

$$SV = BCWP - BCWS = 40 - 44.5 = -4.5 \text{ person days}$$

$$CPI = \frac{BCWP}{ACWP} = \frac{40}{36.5} = 1.0959$$

$$CV = BCWP - ACWP = 40 - 36.5 = 3.5 \text{ person days}$$

$$\% \text{ schedule for completion} = \frac{BCWS}{BAC} = \frac{44.5}{140} = 31.7857\%$$

$$\% \text{ complete} = \frac{BCWP}{BAC} = \frac{40}{140} = 28.5714\%$$

## 9. Risk Management

Risks	Category	Probability	Impact	RMMM
Poorly defined requirements	Process Definition (PR)	60%	2	Multiple meetings with the customer and stakeholders to improve requirements
Over-optimistic scheduling	Process Definition (PR)	50%	2	Proper mathematical calculation and assumption for time scheduling
Resistance to change by stakeholders	Customer Characteristics (CU)	50%	3	Change control, incremental development
Insufficient testing time	Development Environment (DE)	70%	2	Allocate sufficient time for testing and create test plans, create more comprehensive test cases.
Miscommunication between teams	Staff Size and Experience (ST)	55%	3	improve communication channels and conduct regular team meetings
Technology integration issues	Technology to be Built (TE)	40%	2	Conduct integration testing and use modular design approaches
Lack of domain expertise	Staff Size and Experience (ST)	50%	2	Technical analysis, cost-benefit analysis, prototyping, training
End user resist system	Business Impact (BU)	40%	3	User training, involvement, feedback.
Inadequate documentation	Development Environment (DE)	60%	2	Ensure proper documentation guidelines, review after every update on logfile
Unstable development environment	Development Environment (DE)	35%	2	Stabilize and monitor the development

				environment, provide required utilities.
Unanticipated hardware failure	Technology to be Built (TE)	25%	1	Invest in hardware redundancy and monitoring systems
Data security vulnerabilities	Technology to be Built (TE)	40%	1	Conduct regular security audits and implement best practices