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American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science &Technology (FST)

Fall 22_23

Section: G

Group No: 5

Women Safety: On the Road

A software Engineering project submitted.
By

Semester: Fall_22_23		Section: G	Group Number: 5	
SN	Student Name	Student ID	Contribution (CO1+CO2)	Individual Marks
16	DEY, TONMOY	20-44206-3	20%	
17	ROY, SHOWMITRA	20-44208-3	20%	
18	ADNAN, MD. ABDUL MUNEEM	20-44213-3	20%	
20	HOSSEN, RABBI	20-44220-3	20%	
24	DHAR, JOYDEP	20-44237-3	20%	

The project will be Evaluated for the following Course Outcomes

Your Project will be Evaluated based on the following marking criteria		Total Marks
Identify and Analyze Requirements (functional, quality, and project req.)	[5Marks]	
Design the System Interface (UI/UX design)	[5Marks]	
Prepare Test cases and Test plan	[5Marks]	
Prepare WBS and Project Schedule	[5Marks]	
Identify potential risks and Prepare a risk management plan	[5Marks]	
Submission, Completeness, Spelling, Grammar and Organization	[5Marks]	

Submission Date: 12-12-2022

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CHAPTER 1: PROJECT PROPOSAL

1.1 Background to the Problem

Women's safety has long been a significant problem. Women's safety is crucial, whether at work, at home, or outside. In particular, rape instances, few crimes against women were truly horrifying and scary. Most women of all ages still endure abuse, domestic violence, and assault on a regular basis. It's important for women to travel late at night, so use caution and awareness. There may still be a need for a women's safety app to help with their safety even while the government is taking the necessary efforts to ensure it. Lack of security and knowledge is one of the main causes of this problem. Nowadays, there are increasing cases of murder, trafficking, and sexual assault. The issue is primarily caused by men's domineering nature. For a developed country, men and women must work together. As part of our responsibility, we must protect their security. so as to save them from being a victim.

1.2 Solution to the Problem

To provide safety to women from any kind of sexual abuse by using Information technology.
A mobile application with an information layer between all the people and police departments. The user does require to choose any technology she wishes to adopt example: A Smartphone with a sensor. We think it is the appropriate solution for solving women's safety on the road. This solution model is feasible to meet the business model because we will have to deal with the Government.
The user needs to activate the device or the app installed on the smartphone when she travels alone. Once activated, the service provider will keep track of the user. If when the user feels, she is under threat, she needs to in case of emergency on moving the phone up and down thrice, the system sends SMS and calls to one of the numbers fed into the system with the location. The Information system of the service provider will give calls to the nearest 5 people located near the user. The system uses predictive analytics to choose whom the call should go to, and make sure the call goes to the best appropriate person. Simultaneously an alert shall be sent to the nearest police station by the Information system with the details of all people (including suspects and witnesses) captured using predictive analytics intelligence of IS. All the information transferred to the police shall be 100% accurate with facts and proof
The target group of users in our solution is women. they are mostly harassed on public transport. So, we can reduce the crime rate. The benefit of this application are many women can travel safely and are not victim of crime.
Research has found that from 2018-2022, the crime rate of women increased by 23% more than before. Which is really an eye-catching one.

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CHAPTER 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. The waterfall model is used when all requirements are clear. But the requirements of our project may need to change day by day. So, we choose the SCRUM model, because it is a continuous improvement and requirements can be added in daily SCRUM meetings. Our project is a complex and object-oriented project. The waterfall model has a high amount of risk and uncertainty. This project will be an ongoing project (we will update after a certain time) and for ongoing projects, the waterfall model is inadequate. The prototype model is lengthy and costly. If any requirement is changed, we must make changes in every step. On the other hand, the SCRUM model is economical and lower time complexity. It offers freedom of implementation, and each requirement of our project is different from another requirement. There is no boss in this model. But there is a scrum master who manages all individual tasks in scrum meetings. The systems which are not modularized appropriately cannot use this model. User involvement is required throughout the life cycle. It is not designed for small-scale projects as in such cases, the cost of using automated tools and techniques technology may exceed the entire budget of the project. identifies business requirements by looking at the effective team and individual performances. RAD can only be used to construct systems that can be built modular. Requires highly skilled developers/designers. High dependency on modeling skills. It required highly skilled designers. Needs strong team collaboration, Needs highly skilled developers. reduced features as an outcome of "time boxing," for which features are held until a subsequent version in order to complete a release quickly. Because a RAD-developed application starts as a prototype and develops into a full application, there is less scalability. As a result, it is hard to monitor both progress and difficulties, and there is no documentation to back up what has been done. The huge technical risk makes it inappropriate. We don’t use the V-model because there are some disadvantages. In both models, the client does not see the finished product until everything is virtually complete. In the V model, it allows the development team to verify the product at multiple levels in the explicit phases is an improvement. Which is the biggest reason we didn’t use the V model. Because when a client can’t review it will be a big issue for the project. And if the client wants to change something it will be very difficult to redo the work. The sawtooth model is also a linear process model but it’s not like the waterfall and V models. In this Sawtooth model, the client is involved to review intermediate prototypes of the product during the process. So, this model is not used. There are no overlaps between each rigid phase of an iteration. Because not all requirements are obtained up front across the entire life cycle, costly system architecture or design difficulties may develop. Highly skilled resources are required for skill analysis. More resources may be required. It is not suitable for smaller projects. Those are the reason we don’t use the iterative model. We found an app named "Women Safety ". It has many features and some of them are very good but some important features are missing like calling or sending messages most the nearest police station or emergency case with evidence. And the most important part is data encryption which is not so strong in this application. We have all of these features and our data encryption is a very important part of this project.

2.2 Project Role Identification and Responsibilities

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Project Role Identification:

- Developers.
- Designer.
- Admin.
- Trackers.
- Tester.
- Policeman.
- Women.
- Lawyer.

Role Responsibility:

- **Developer:** The main work of the developer is to perform all the coding work necessary for the application. It also helps the police by giving the location information.

- **Admin:** Admin plays a vital role. It is responsible to overlook whether everything is working properly or not. If there is any problem then it is his/her work to fix it and inform the responsible person about it.

- **Designer:** The main work of the designer is to check Whether it is user friendly or not. Because at that time the victim will be in rush to ask for help. for that reason, the design of the app should be friendly with the user.

- **Trackers:** Tracker work as an intermediary. Its main purpose is to track the location of the victim and update the information of it.

- **Tester:** The work of the taster is to check whether the app is facing any kind of problem while running or not.

- **Policeman:** The work of a policeman is to move them as hurry as possible to the victim area. So, that they can save them.

- **Women:** They are the main user of the device. If they face any problem then they will directly activate the device in search of help and safety.

- **Lawyer:** As it is a women's safety app. There might be some issues related to the victim. For this reason, lawyers place an important role.

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2. PRODUCT AND PROJECT DESCRIPTION

2.1 System Features

1. Software Sign Up:

Functional Requirements:

1.1 Software will allow users to register with either their phone number or email address.
1.2 After the first step is successful, the software will collect user data (Name, Date of Barth).
1.3 Software compels users to create secure passwords.
1.4 The software will issue a verification code by email or phone number if all the stages have been followed.
1.5 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 phone number.
Cross-references: N/A

2. Software Login:

Functional Requirements:

2.1 Login users may log in to the software using their provided username, email address, or phone number and password.
2.2 The username and password used for login will be compared to database records.
2.3 If the login process is successful, the home page will be shown.
2.4 The system will produce a random verification code and send it to the user's email address to try again if the username and/or password have been entered incorrectly.
2.5 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 User ID and Password.
Cross-references: 1

3. Profile:

Functional Requirements:

3.1 If the customer using this app without login, then they have to login to see the profile.
3.2 The user can set his or her age, gender, and location after logging into the ID.
3.3 The user may also enter any previous report that she harassed or not.
3.4 In case of an emergency, the user may set more than one relative's contact number.

Priority level: High.
Precondition: The user must register with Phone No./Gmail and login.
Cross-references: 2

4. Forget Password:

Functional Requirements:

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4.1 Users need to provide a valid email/phone number to recover the account.
4.2 If the entered email address is valid, send an email with a reset link to it.
4.3 Reset link provides some sort of token to identify the user account and save its information.
4.4 When password is reset, generate a new token and save it to the user account.

Priority level: High.
Precondition: The user must register with Phone No./Gmail.
Cross-references: 1

5. Map:

Functional Requirements:

5.1 Software will allow access to the map on the user's device.
5.2 The software displays a map with all of the nearby police station.
5.3 The map will directly connect with google map.
5.4 So that the user must need a google account.
5.5 Users must always turn on their location when using this software.

Priority level: Medium.
Precondition: The user must login with a valid id with password.
Cross-references: N/A

6. Emergency Contact:

Functional Requirements:

6.1 Users can add three emergency contact numbers from their relatives.
6.2 Users must provide a valid contact number.
6.3 The system will check the number to see if it is correct or not and send a notice if it is.
6.4 Users can also update emergency contact if needed.
6.5 The system will send a verification code to the user's giver number to verify.

Priority level: High.
Precondition: The user must login with a valid id with password.
Cross-references: 1,2

7. Alert Button:

Functional Requirements:

7.1 Users need to click the button when they are in danger.
7.2 If the user is not able to click the button, they shake the device three times the alert button will be automatically on.
7.3 If the users unintentionally press the button or shake the device three times, they need to press the stop button within 30 seconds and give feedback.
7.4 After pressing the button, the system automatically finds the location of the users and informs the police.

Priority level: High.
Precondition: The user must login with a valid id with password.
Cross-references: 1,2

8. Emergency Settings:

Functional Requirements:

8.1 If any user finds that any of women face any problem in road but not using this app, she can provide an address to the system.
8.2 User can provide the audio/video.
8.3 The system will provide the user with the nearest police station location & contact number.
8.4 And the system will also inform the police and give the location.

Priority level: High.
Precondition: The user must login with a valid id with password.
Cross-references: 1,2

Non-Functional Requirements:

- To help users save their precious time and lives, we'll provide the fastest service we can.
- Personal information provided by users will be secured on our system so that their data remains private.
- This application will have a database entry. Therefore, if a user spams by phone calling unnecessarily, it will be easy to find those users' addresses and phone numbers. We will let the police know about it.
- This app will be available on all major operating systems including Android, the MS Store, IOS, etc.
- Additionally, our app will offer an online version that users can access from any computer and any browser anywhere at a time.
- The user will have access to a support desk where they may call, email, or use online chat to communicate with a representative. It will open for a several hours where users can report their feedback.
- This program is simple to maintain. There will be a standard version and firmware update system that will give users flexibility and reduce bugs decrease issues.

2.2 System Quality Attributes

QA 1. Availability: The system shall be at least 98.5 percent available every seven days a week and 365 days a year.

Priority level: High
Precondition: Must have maintainability attribute
Cross-reference: QA-6

QA 2. Efficiency: There are at least 3.5 percent of the processor capacity, disk space 2.0 MB/S, memory 130MB and communication bandwidth 512kbps shall be available to properly run this system.
Priority level: High
Precondition: N/A
Cross-reference: QA-3, QA-5, QA-7

QA 3. Flexibility: A maintenance programmer who has at least 5 months of experience shall be able to add new features and functions including code, modifications and testing into the system within no more than three hours.
Priority level: Medium
Precondition: N/A
Cross-reference: QA-2, QA-4, QA-6, QA-7

QA 4. Integrity: When a user tries to login into the system, there shall have to be two step verification. While the user is attempting to log in, the system will send a verification code to the user via mail and user shall have to use that verification code to login and the second step is user shall have to use their own password while they create the password to sign up this system.
Priority level: High

Precondition: N/A
Cross-reference: QA-2, QA-5, QA-7

QA 5. Interoperability: When a user signs up to the system the user has to give some of their general information like username, phone no., email. So, the system needs to justify the information whether the user given information. For that reason, the system shall be able to import valid information which shall have matched the user given information. The system shall import the information from the local election commission office.
Priority level: High
Precondition: N/A
Cross-reference: QA-2, QA-3, QA-4,

QA 6. Reliability: The system shall no more than three experimental runs out of 850 can be lost because software failure.
Priority level: High
Precondition: N/A
Cross-reference: QA-1, QA-2, QA-3, , QA-7

QA 7. Usability: A trained user shall be able to submit a complete request
selected from a vendor catalog in an average of one and a maximum of three minutes.
Priority level: High
Precondition: N/A
Cross-reference: QA-2, QA-7

2.3 Project Requirements

- **Time**: We need three months to develop this software (12 weeks).
- **Environment:** In order to develop this software, we need a setting. Therefore, we are designing office space.
- **Budget:** To develop this program, we'll need something like 38000 USD.
- **Resources:** To construct this program, we will require a total of 5 people.
- **Equipment:** We need tools to develop this program. a Five-computer setup, Five tables, Five comfortable chairs, One Whiteboard and a steady internet connection.
- **Internet:** We require strong bandwidth support for 24 hours. This corresponds to 80-100 Mbps.
- **Tools:** We require Eclipse and Visual Studio for the development of the software as well as Zoom online platform for daily scrum meetings.

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3. SYSTEM DESIGN SPECIFICATION

3.1 UI/UX Design

Fig: Front page

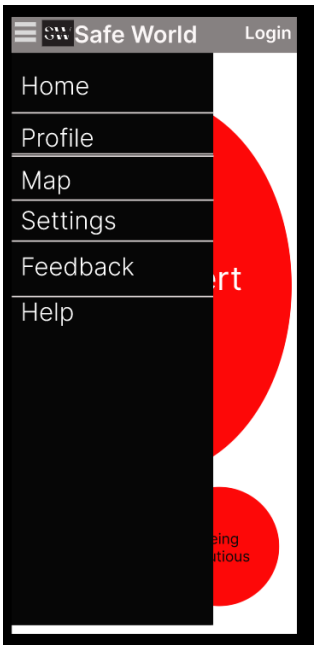


Fig: 3 dots

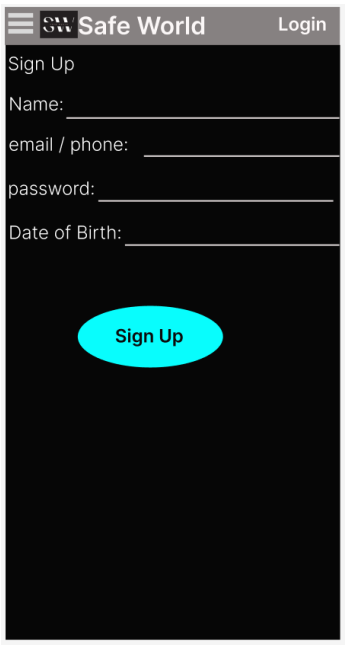


Fig: Sign Up

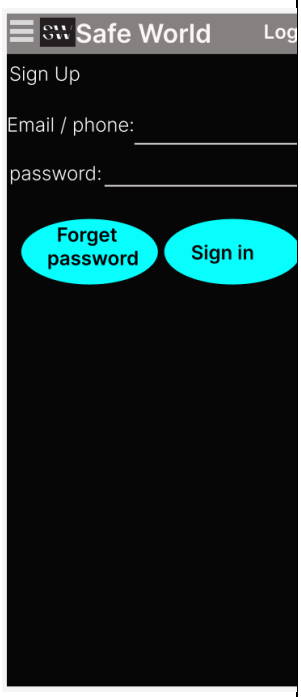


Fig: sign in

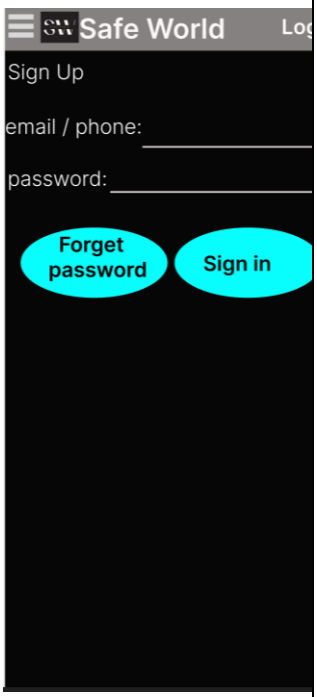


Fig: Login

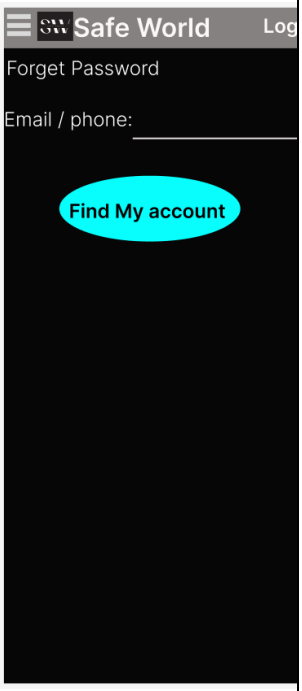
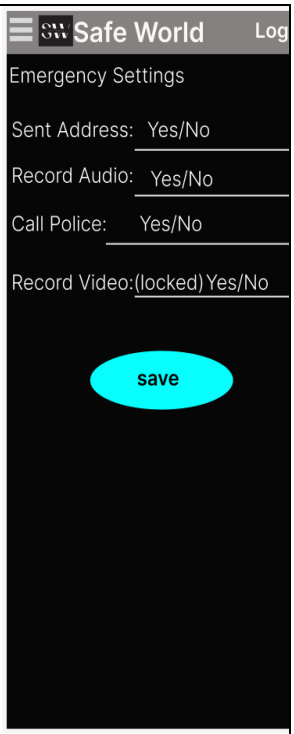


Fig: forget password



4. SYSTEM TEST PLAN

We shall be developing this software for smartphone operating systems (Android/IOS)

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Project Name: Women Safety on the Road			Test Designed by:	
Test Case ID: FR_1			Test Designed date: 06-12-2022	
Test Priority (Low, Medium, High): Medium			Test Executed by:	
Module Name: Account Login			Test Execution date:	
Test Title: Verify login with valid username and password.				
Description: Test account login page				
Precondition: User must have valid username and password				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Launch the app 2. Enter username 3. Enter password 4. Click Log in	Nill 123456	Go to homepage with log in ID.		
Post Condition: User is validated with database and successfully login to account. The account session details are logged into the database.				

Project Name: Women Safety on the Road			Test Designed by:	
Test Case ID: FR_2			Test Designed date: 05-12-2022	
Test Priority (Low, Medium, High): Medium			Test Executed by:	
Module Name: Account Registration			Test Execution date:	
Test Title: Verify login with valid username and password.				
Description: Test account registration page				
Precondition: 1. User must fill all valid information and the password should be at least 6 characters 2. Choose password and then confirm password again should be matched. 3. Id should be completely new. No existing id will be accepted.				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Enter name 2. Gender 3. Dob 4. Region 5. Choose id 6. Choose password 7. Confirm password	Showmitra Roy Male 30/12/2001 Bangladesh Showmitra321 123456 123456	Successfully created a new account and went to log in page.		
Post Condition:				

Project Name: Women Safety on the Road			Test Designed by:	
Test Case ID: FR_3			Test Designed date: 06-12-22	
Test Priority (Low, Medium, High): Medium			Test Executed by:	
Module Name: Find Emergency Contact			Test Execution date:	
Test Title: Verify login with valid username and password.				
Description: Test Emergency contact page				
Precondition:				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Select emergency type (e.g., Police, Fire service) 2. Select district 3. Select thana 4. Select area	Police Dhaka Motijheel Kamalapur	Show all the emergency contact numbers as user chosen.		
Post Condition: User is validated with database and successfully login to account. The account session details are logged into the database.				

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5. PROJECT MANAGEMENT PLAN

5.1 Project Scheduling

WBC Breakup Structure:

Budget estimation:

The source line of our code (SLOC) is 10500
Coefficient$_{<\text{Effort Factors}>}$ = 2.5
Project Complexity, P = 1.05
SLOC Dependent Coefficient, T = 0.32
Now,

$$\text{Effort} = PM = \text{Coefficient}_{<\text{Effort Factors}>} * (SLOC/1000)\ \hat{}^{P}$$
$$= 2.5 * (10500/1000)\ \hat{}^{P}$$
$$= 2.5 * (10500/1000)\ \hat{}^{1.05}$$
$$= 29.5$$
$$= 30$$

$$\text{Development time} = DM = 2.5 * (PM)\hat{}^{T}$$
$$= 2.5*(30)^{0.32}$$
$$= 7.4$$
$$= 7 \text{ months (28 weeks)}$$

$$\text{Required number of people} = ST = PM/DM$$
$$= 30/7$$
$$= 4.2$$
$$= 5$$

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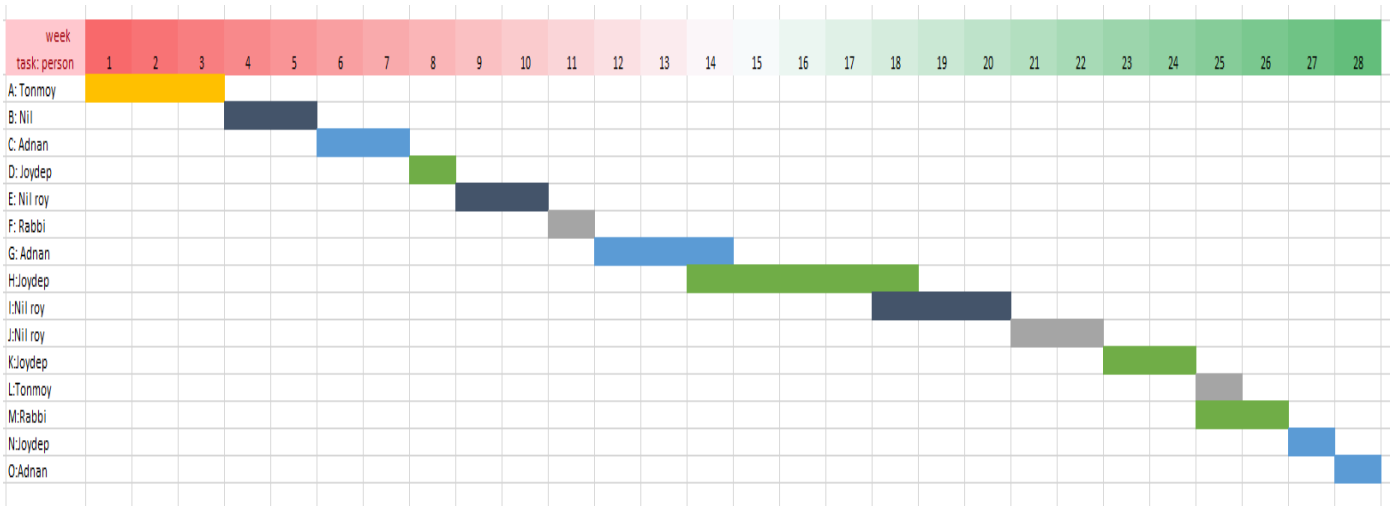
Timeline Chart:



A: Overall design

B: Specify module 1

C: Specify module 2

D: Specify module 3

E: Specify module 4

F: Specify module 5

G: Specify module 6

L: integration testing

H: Code module 1

I: Code module 2

J: Code module 3

K: Code module 4

M: Code module 5

N: Code module 6

O: System testing

5.2 Risk Analysis

S/N	Risk Description	Probability	Impact	Mitigation Plan
1	Larger Number of users than planned	67%	Server down	Having scope for upgrading's
2	Network problem	55%	Cannot make a suitable contact	More network tower should be built
3	Overflow of Total Budget	60%	Project will be more costly	Need to keep a good tracking On budget
4	Customer requirements changes frequently	47%	Cost will increase	Collecting proper idea about the project
5	Lower number of Employees	53%	working processes will Slow down	Need best qualified experience employee
6	Schedule Problem	35%	Working delay	Make good plan

THANK YOU