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Department of Computer Science

Faculty of Science &Technology (FST)

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Section: K

Group No: 8

Cyberbully Preventing Management

Submitted To

Dr. Md Alamgir Kabir

An Object-Oriented Analysis and Design (OOAD) project submitted
By

SL No	Student Name	Student ID	Contribution
01.	Tasnim Alam Nibal	20-42891-1	25%
02.	Sami Nabi	20-43418-1	25%
03.	Rifath Bin Mashrur	20-42079-1	00%
04.	Farhana Sultana	20-43716-2	25%
05.	Mahin Noor Imam	20-43667-2	25%

Contents

Cyberbully Preventing Management

Abstract:

The sole purpose of this report is to present a suitable solution to stop cyberbullying. As a solution, an app is introduced where people can report cyberbullying and get the necessary help from it

Background Information:

Cyberbullying is a global phenomenon since the emergence of social media and online interactions. "Cyberbullying involves the use of information and communication technologies to support deliberate, repeated, and hostile behavior by an individual or group that is intended to harm others [1]." It happens either on the Internet or through other social media facilities. “Most of the time, the culprit, referred to as “bully”, acts anonymously so that the victim does not know from whom the attacks come [2].” Cyberbullying is putting a lot of people into depression and forcing people to act on their impulses. It also harms people’s physical and mental health. It is a growing concern to parents, police, educators, and the public in general because of its increased prevalence and the fact that it has been implicated as a factor in several teen suicides. “The Pew Internet and American Life Project on cyberbullying conducted a similar study in 2006 which found that one out of three teens have experienced online harassment[3].” People are stopping social media usage for consistently being bullied online. The impact of cyberbullying is much greater than people can anticipate.

Objectives:

- Preventing cyberbullying
- Make people aware of cybersecurity laws
- Gathering help for online difficulties
- Introducing people about safety course

Scope:

Our project is targeted to prevent the cyberbullying by using an app called cyber reaper.

Features & functionalities of the app:

In this app, people will be able to report harassment 24/7. Ask for help from any professional regarding any difficulties online. Another option where people can enter their experience regarding cyberbullying and the solutions they took. As some people are unaware of cybersecurity laws, there will be an option where the laws will be recorded. There will be another option for a safety course. From the courses, people can easily learn and understand cybersecurity and how to protect themselves from cyberbullying in this vast cyber world.

Proposed Solution Technical Components

- **Proposed Solution**

The solutions we are going to propose is to deal with the problem cyberbullying. People need safety in their every aspect of life. We will get them that scope of safety by suggesting them an app .

- **Technical component solution**

As a technical component Solution, an app has been introduced called cyber reaper. Its purpose is to providing help to its user without much any survey. The benefits of this app are users can act against cyberbully. The objective or goal is improving the safety for every user.

- **Benefit of the functionality**

As people are deepening online-platform day by day, it's also a matter of fact that they need safety on that platform too. As this app act against cyberbullying people are bound to use it for their safety. The project is innovative because its helps to take steps to act against cyberbully and secure users' safety. It will benefit people in the future for safer internet and will make more secure about themselves.

Scenario:

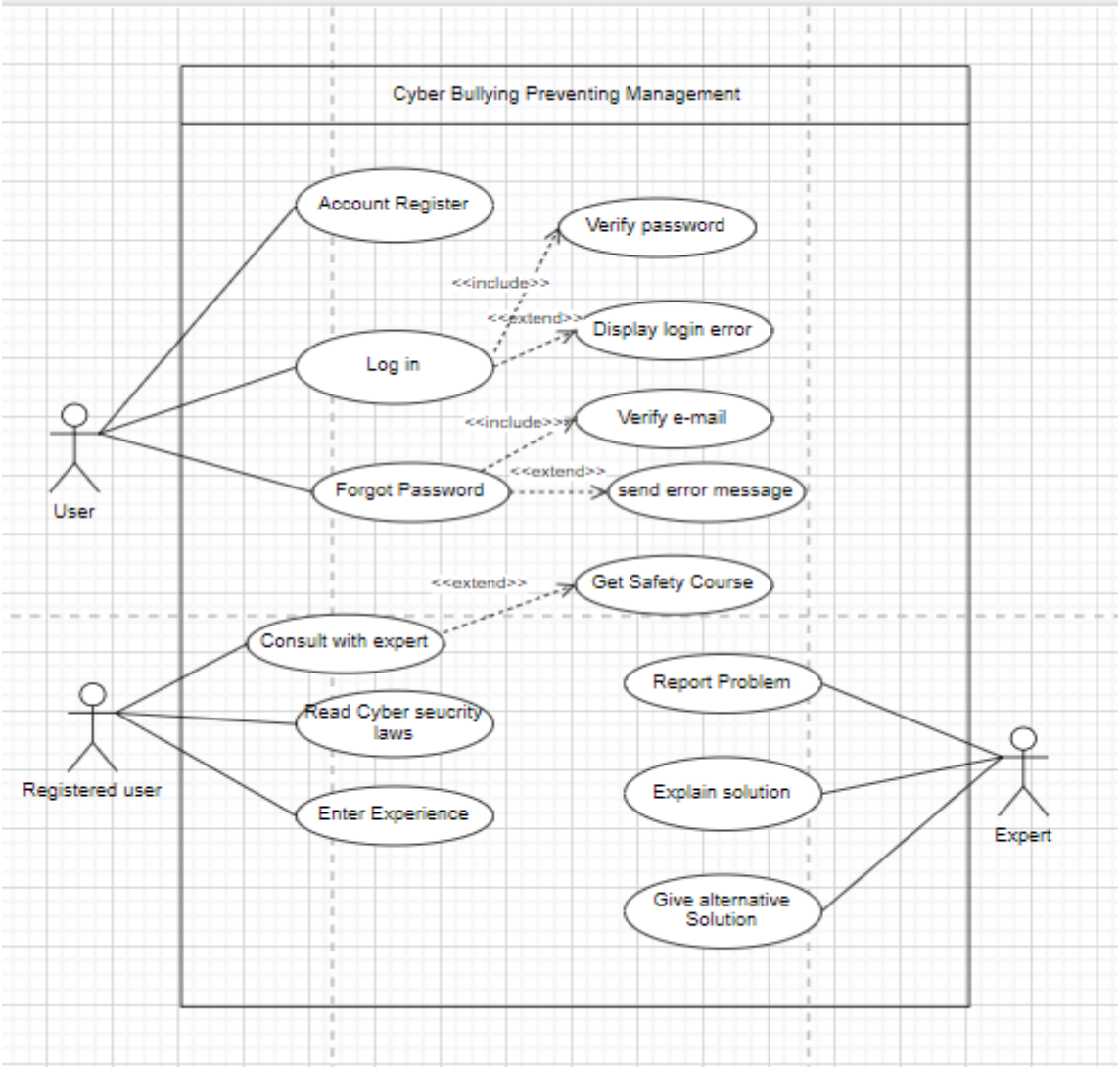
Cyberbully preventing management project will introduce an app "Cyber Reaper" to prevent cyberbullying. User must log in with id & password in the application. If the id & password incorrect then system will display login error, and user must log in again. Then they will get some introduced option to proceed. One is to ask for help regarding any difficulties in the service or system management, where some professional will be provided to help all kinds of users. second option is used where people can enter their experience regarding cyberbullying and the choose their solution of action. As some people are unaware of cybersecurity laws, there will be the third option where the laws will be recorded. Users will read the laws and will know about laws efficiently. The last option will be for user safety. That option is introduced calling safety course. From the courses, people can easily learn and understand cybersecurity and how to protect themselves from cyberbullying in this vast cyber world. After taking all measure user will close the app for the time being will open it again for their own need but this app will give notification in every step of action after completing.

Risks and Constraints:

it can be said that the features of the app are beneficial to stop the global crisis known as cyberbullying, but it won't stop the real life bullying it takes another step of measurements. The app will provide a way to cease cyberbullying and work as a ray of hope to remove negativity from social media but won't be able to stop negative people doing negative doings.

As it is an app introduced project, so the solution is only limited for cyberbullying prevention. The app is designed to give cybersecurity to its user to prevent cyberbully it won't take other sort of action in daily life.

Use Case Diagram: **(submitted by 20-42891-1 and 20-43716-2)**



Use Case Specification: **(submitted by 20-42891-1 and 20-43716-2)**

For Account Register

Use Case Name:	Account Register	
Actor(s):	User	
Description:	This use case describes the process of a user become the registered user.	
Reference ID:	CBPM-001	
Typical Course of events:	**Actor action**	**System Response**
	Step 1: Initial the register process. **Step 2:** Enter personal information.	

	Step 6: User will receive notification through mail or SMS from system.	**Step 3**: The system will verify the information. **Step 4**: The system will add the new registered user information into database. **Step 5:** The system will send notification to user.
Alternative Course of Events:	If the account exists, the system will return an error message to user. User need to change personal information. (Back to step:2)	
Precondition:	User should register only once with a mail id or phone number. Duplicate account is not allowed.	
Postcondition:	Only the new account will be registered.	

For log in

Use Case Name:	Log in	
Actor(s):	User	
Description:	This use case describes the process of registered user to login in the system.	
Reference ID:	CBPM-002	
Typical Course of events:	**Actor action**	**System Response**
	Step 1: Initial the login process. **Step 2:** Enter username and password.	**Step 3:** The system will check the username and password are valid or not. **Step 4**: System will return a verified message to user.

	Step 5: User has logged into the system.	
Alternative Course of Events:	**Step 4:** If the account information is not valid, the system will return an error message. (Back to step 2)	
Precondition:	User should have previous registered account.	
Postcondition:	User has logged into the system.	

For Forgot Password

Use case Name:	Forgot Password	
Actor(s):	User	
Description:	This use case describes the process of	
Reference ID:	CBPM-003	
Typical Course of events:	**Actor action**	**System Response**
	Step 1: initial the forget password process. **Step 2:** enter your email/username. **Step 5:** User has created new password.	**Step 3:** The system will check the email/username valid or not. **Step 4**: System will return a new password type setting to user.
Alternative Course of Events:	**Step 4:** If the email/username is not valid, the system will return an error message. (Back to step 2)	
Precondition:	User should use forget password only when they could not recognize the recent password.	
Postcondition:	User has created new password.	

For Consult with expert

Use case Name:	Consult with expert

Actor(s):	Registered user	
Description:	This use case describes the process of a user consulting with expert.	
Reference ID:	CBPM-004	
Typical Course of events:	**Actor action** **System Response**	
	Step 1: Initial the consult with expert Process. **Step 3:** Confirm the timing.	**Step 2:** Show the consulting time with Expert. **Step 3:** Check if the user is registered. **Step 4:** [extension point: If the user is registered, execute the use case get safety course]
Alternative Course of Events:	**Step 4:** If the user is not registered user, their consulting process can be continued but there will not be any safety course.	
Precondition:	Safety course can only be made after the user is registered.	
Postcondition:	The consulting timing will be recorded.	

For Read Cyber Security Law

Use Case Name:	Read Cyber Security Laws	
Actor(s):	Registered User	
Description:	This use case describes the process of a user read recorded laws.	
Reference ID:	CBPM-005	
Typical Course of events:	**Actor action**	**System Response**
	Step 1: Initial the read cyber security laws **Step 2**: Enter the problem user has faced.	**Step 2:** Find the corresponding laws for user's problem.

	Step 3: User has learned the cybersecurity laws.	**Step 3:** System will show the corresponding recorded laws.
Alternative Course of Events:	**Step 2**: If there are no corresponding laws for user's problem, the system will show popular corresponding laws of other users.	
Precondition:	User must include the problem user has faced to access the corresponding law of the problem.	
Postcondition:	User has learned the cybersecurity laws.	

For Enter Experience:

Use Case Name:	Enter Experience.	
Actor(s):	Registered user.	
Description:	This use case describes the process of a user share their experience with others.	
Reference ID:	CBPM-006	
Typical Course of events:	**Actor action**	**System Response**
	Step 1: Initial the Enter Experience. **Step 2:** Enter how the expert's suggestions helped to the user.	**Step 3:** The system will send notification to the user.
Alternative Course of Events:	If the user has not consulted with expert at least once system will not accept the response.	
Precondition:	User should have consulted with expert at least once.	
Postcondition:	User has shared experience into the system.	

For Report Problem:

Use Case Name:	Report Problem
Actor(s):	Expert
Description:	This use case describes the process of expert report the problem to save system database.

Reference ID:	CBPM-007	
Typical Course of events:	**Actor action**	**System Response**
		Step 1: Make a report according to the details user has given. **Step 2:** Save the report to the system Database.
Alternative Course of Events:	none	
Precondition:	If the user is not registered, then the report will not save to system database.	
Postcondition:	Expert has saved the report in system database.	

For Explain Solution:

Use Case Name:	Explain Solution	
Actor(s):	User, Expert	
Description:	This use case describes the process of expert suggest solution to user.	
Reference ID:	CBPM-008	
Typical Course of events:	**Actor action**	**System Response**
	Step 1: Initial the Explain Solution **Step 2:** State the problem to expert.	**Step 3:** Check user has been selected consulting time. **Step 4:** Give solution according to User's problem.

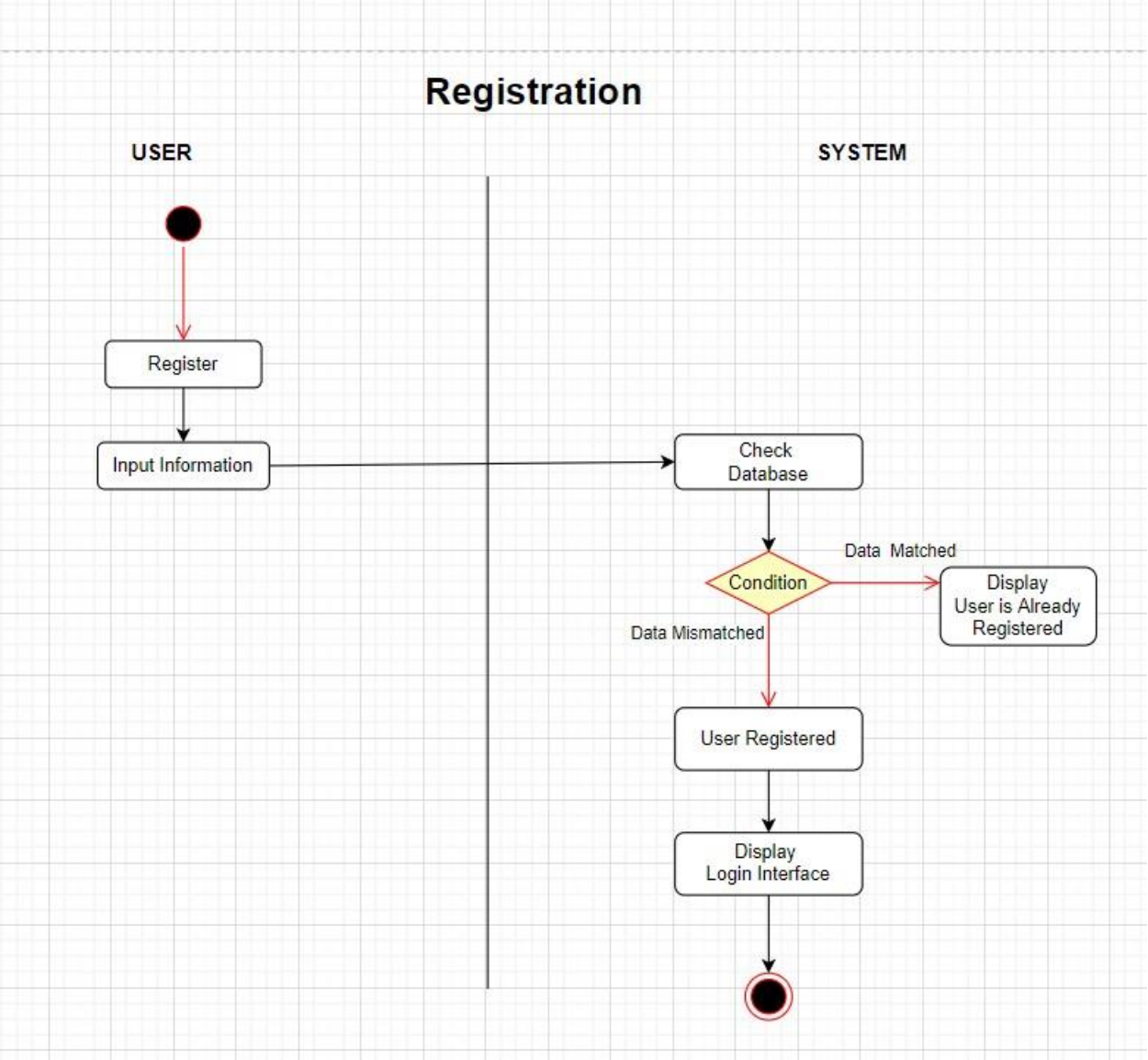
Alternative Course of Events:	If the user has not selected consult timing, system will send an error message. (Back to step 2)	
Precondition:	User should have selected consult timing with expert.	
Postcondition:	Expert has explained solution according to user's problem.	

For Give Alternative Solution:

Use Case Name:	Give Alternative Solution	
Actor(s):	Expert	
Description:	This use case describes the process of giving alternative solution to user.	
Reference ID:	CBPM-009	
Typical Course of events:	**Actor action**	**System Response**
	Step 1: Initial the process give alternative Solution. **Step 2:** State for alternative solution.	**Step 3:** Providing alternative solution if user doesn't like the first solution.
Alternative Course of Events:	Not Available.	
Precondition:	User should have consulted before. If they have any issue then expert will give alternative solution.	
Postcondition:	The completed update will be recorded.	

Activity Diagram : **(submitted by 20-43418-1)**

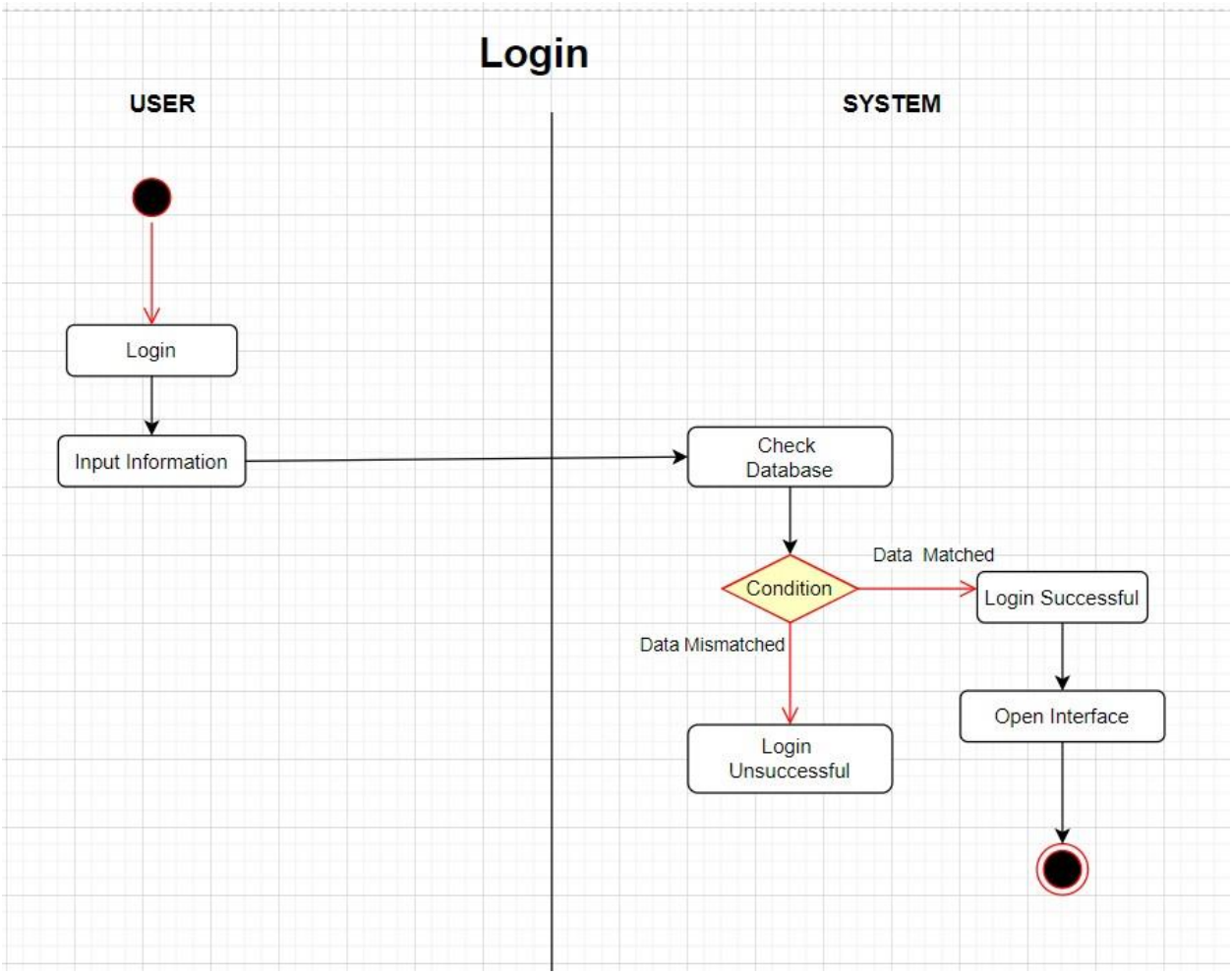
1) Registration



Description:

To register user must input the valid information. System checks whether the information is unique or not for confirming registration. If the data is unique then the system confirms the registration and displays Login interface.

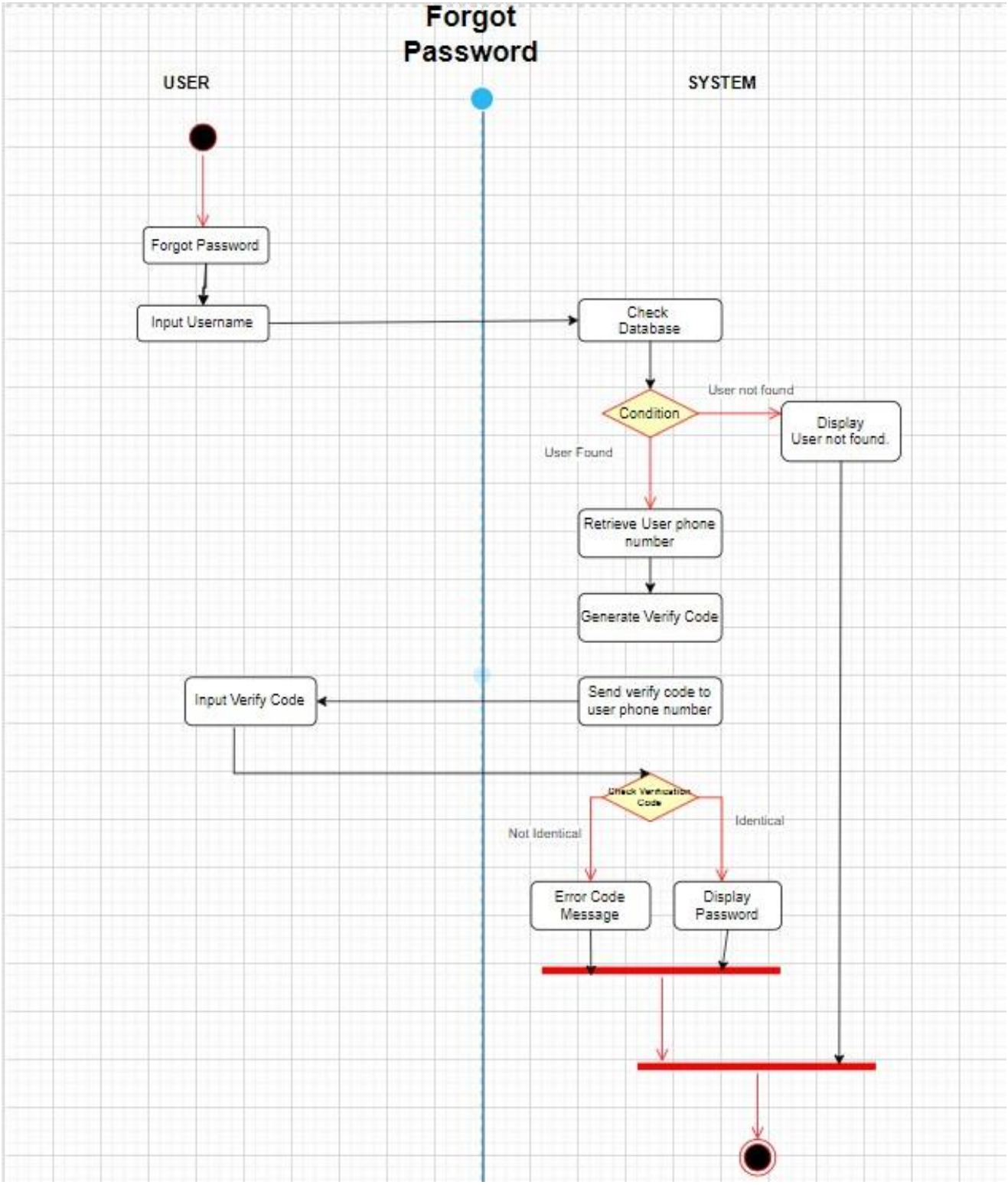
2) Login



Description:

To login the user must input the valid information. System then checks in database whether the information is valid or not. If the information matches with the information in database then the user logins to the interface otherwise it displays Login Unsuccessful.

3) Forgot Password

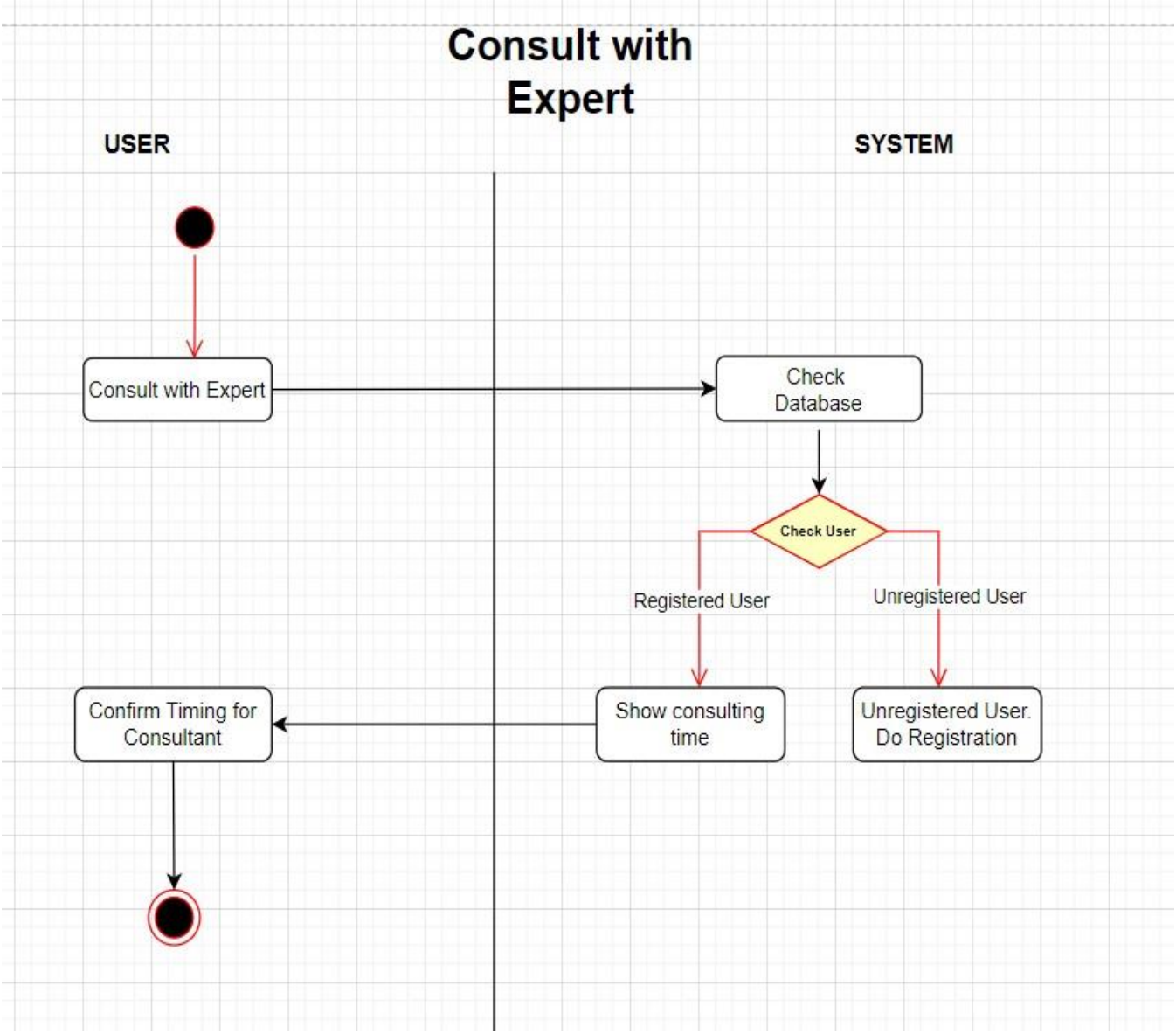


Description:

If the user forgets his/her password then the user can select forgot password option and input his/her username. System checks the username is valid or not

in the database. If the username is not valid then the system displays user not found. If the user name is valid then the system retrieves user phone number, generates verification code and sends it to users phone number. After getting the verification code users will input the verification code. Then system verify's whether the code is valid or not. If the verification code is valid then the system displays password or gives option to change the password. If the code is not valid then the system displays Error Code.

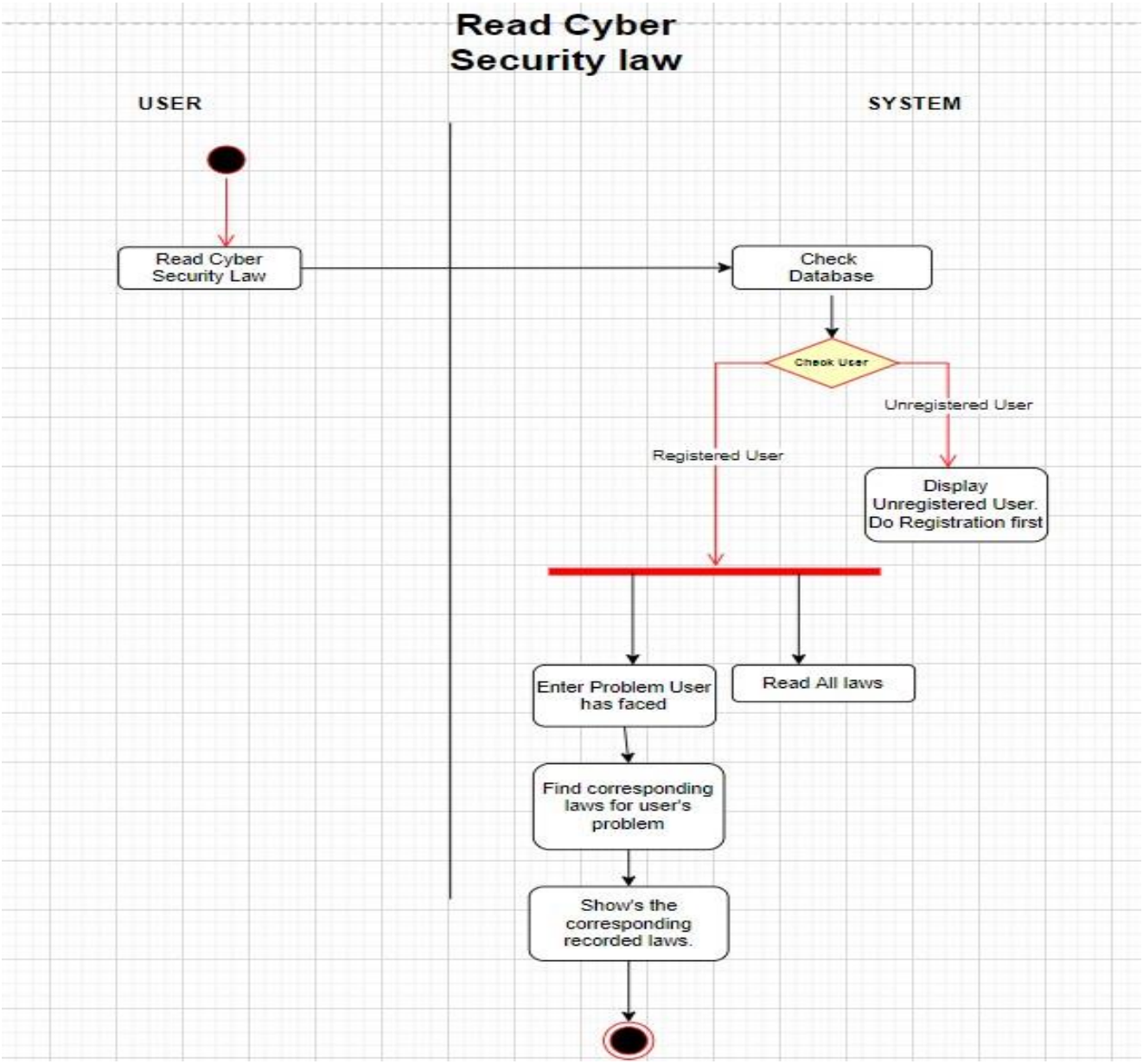
4) Consult with expert



Description:

To consult with an expert the user can select the consult with expert option. After selection the option the system verify's the user whether it's a Registered user or not. If the user is not registered user then the system displays Unregistered user. Do Registered first. If the user is Registered user then the system shows Consulting Time. Then the user can confirm their desired time for consulting.

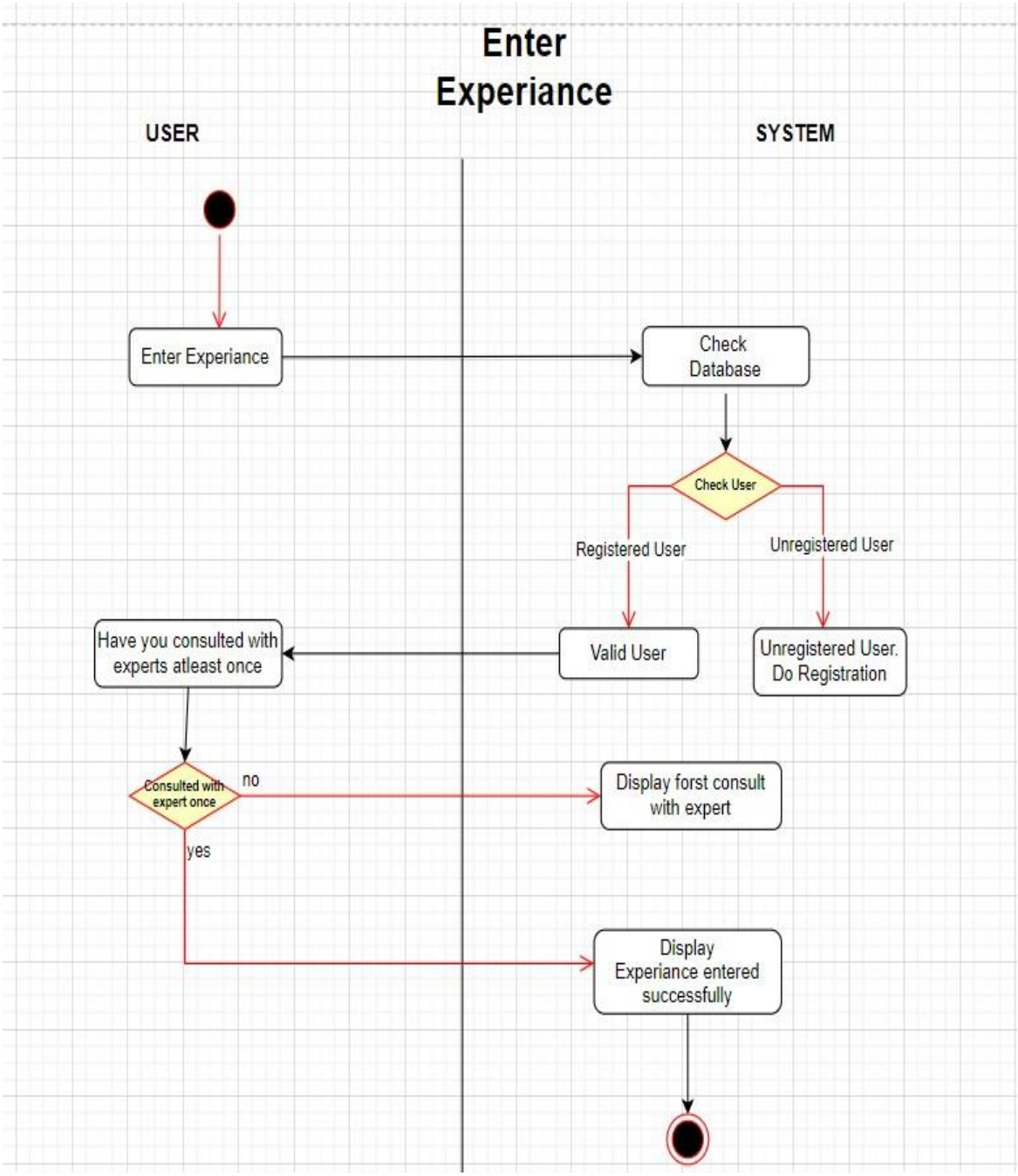
5) Read Cyber Security Law



Description:

To read Cyber Security laws the user can select the Read Cyber Security Law option. After selecting the option the user checks whether the user is verified or not. If the user is not verified then the system displays the user is not registered and says to do registration first. If the user is registered then the system displays two option. First one is the option to read all the laws. Second one is to enter the problem that the user has faced. The system finds the corresponding laws to the user inputed problem and displays it.

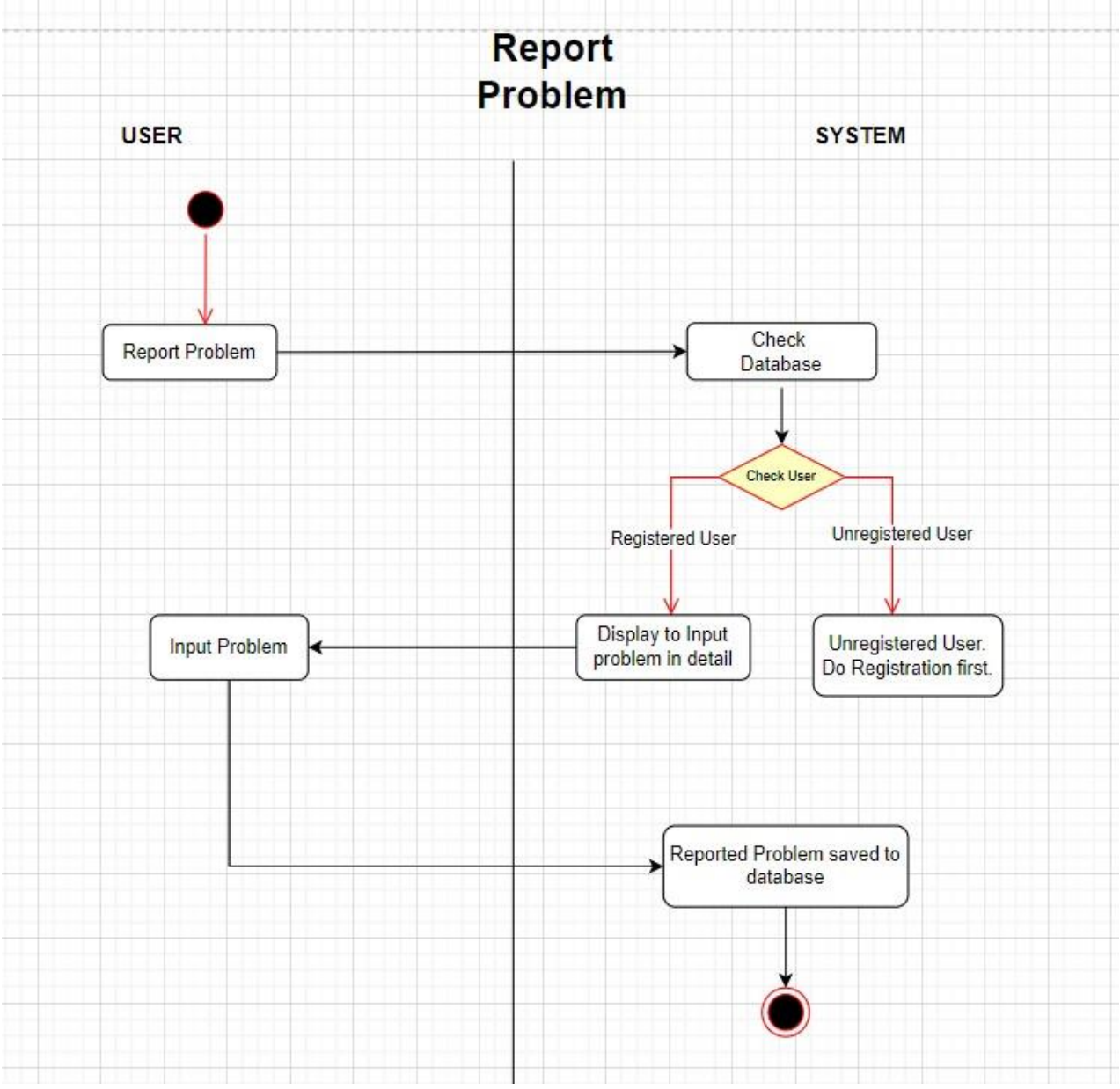
6) Enter Experience



Description:

To enter experience the user should select the Enter Experience option. After selecting the system checks whether the user is registered or not. If the user is not registered then the system displays Unregistred User. Do Registration. If the user is registered then the system displays whether the user consulted a expert atleast once or not. If not then the system displays to first consult with expert. If Yes then the system displays Experience is entered successfully.

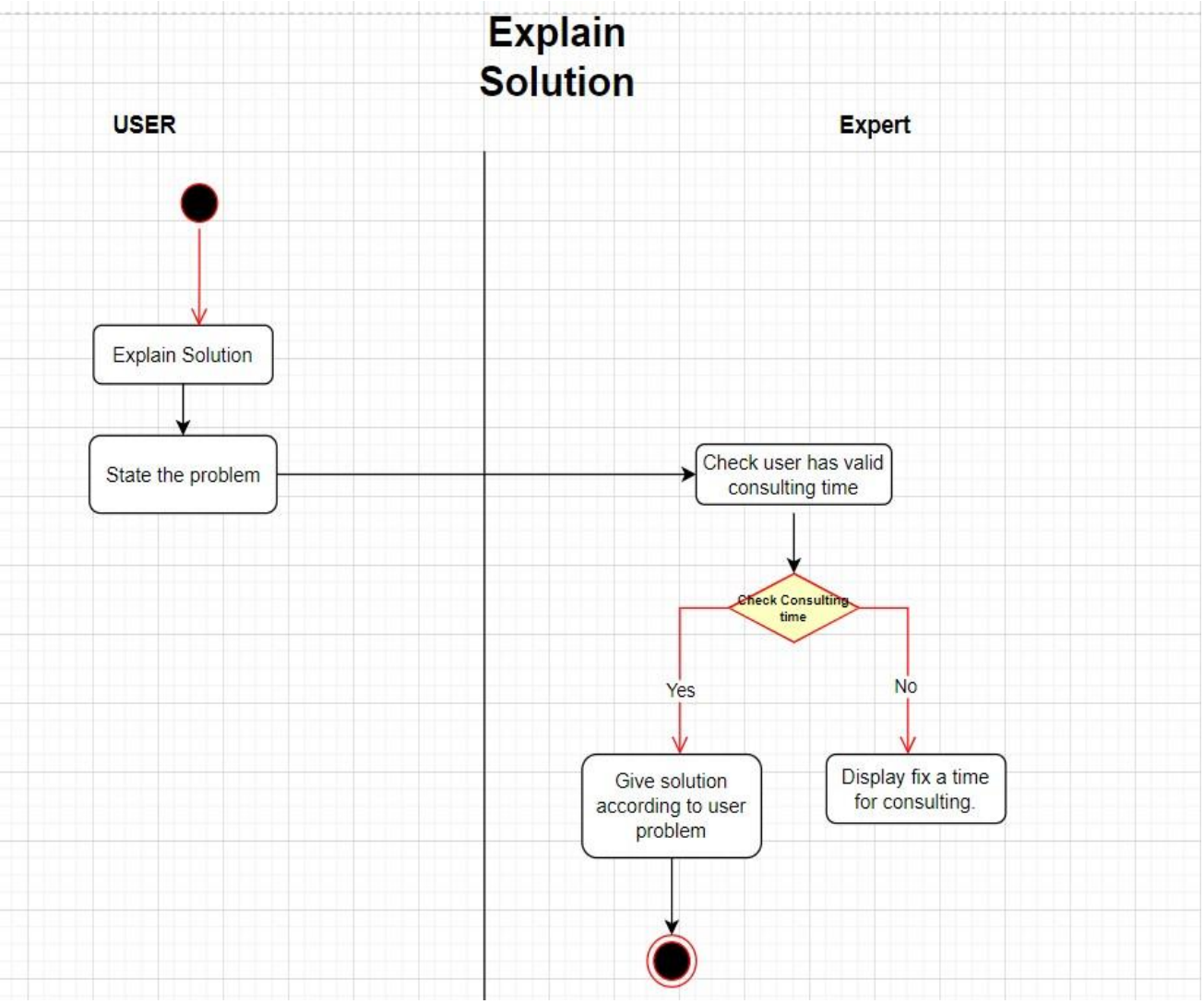
7) Report Problem



Description:

To report problem the user will select the Report Problem option. Then the system checks whether the user is registered or not. If the user is not registered then the system displays Unregistered User. Do Registration first. If the user is registered user then the system inputs problem from the user. And the system saves the reported problem to the database.

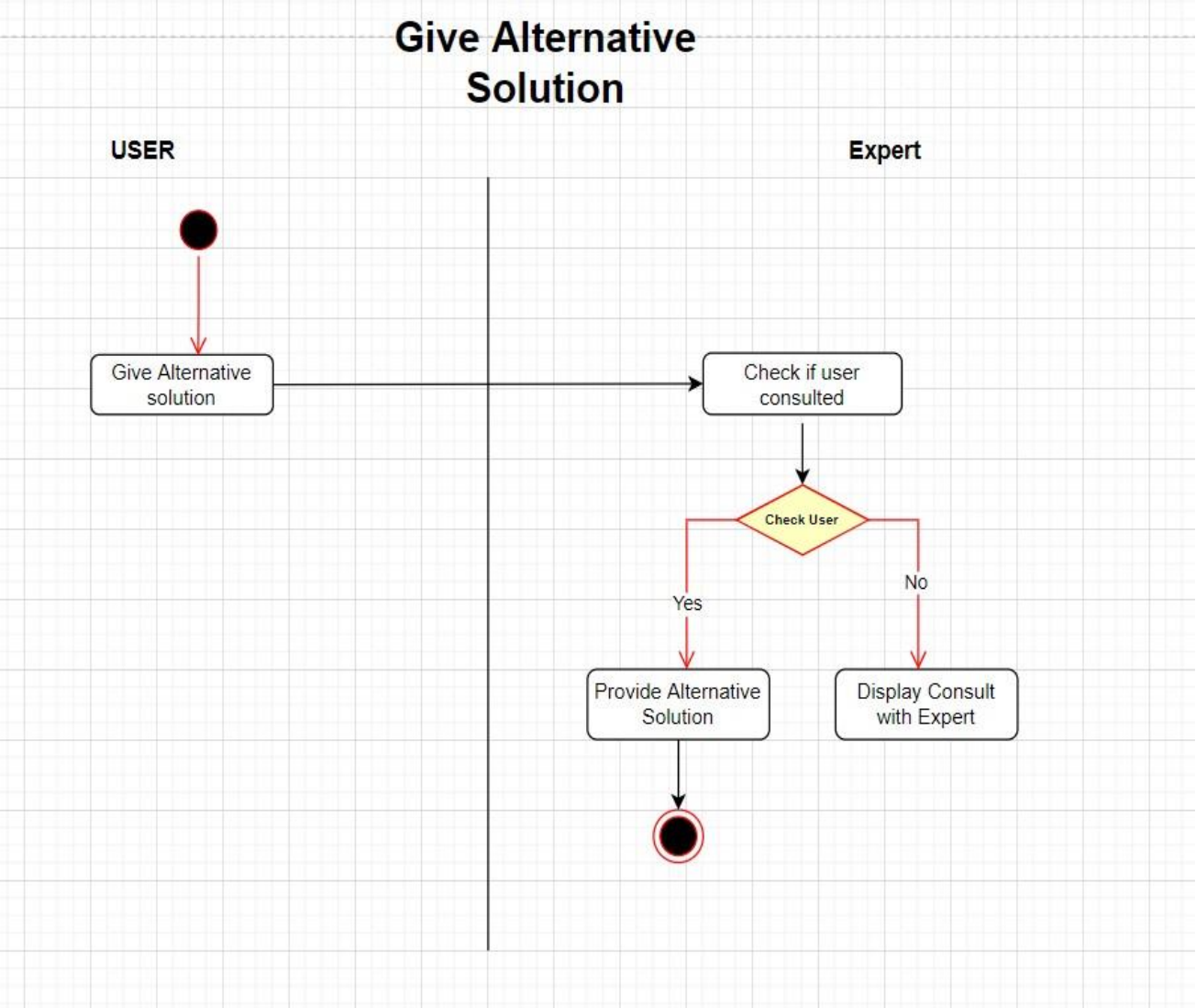
8) Explain Solution



Description:

To get explanation of a problem the user can select the Explain Solution, Then the user state's the problem. Expert then checks whether the user has valid consulting time or not. If the user have valid consulting time then the expert gives solution to the user problem if not then the expert displays to fix a time for consulting.

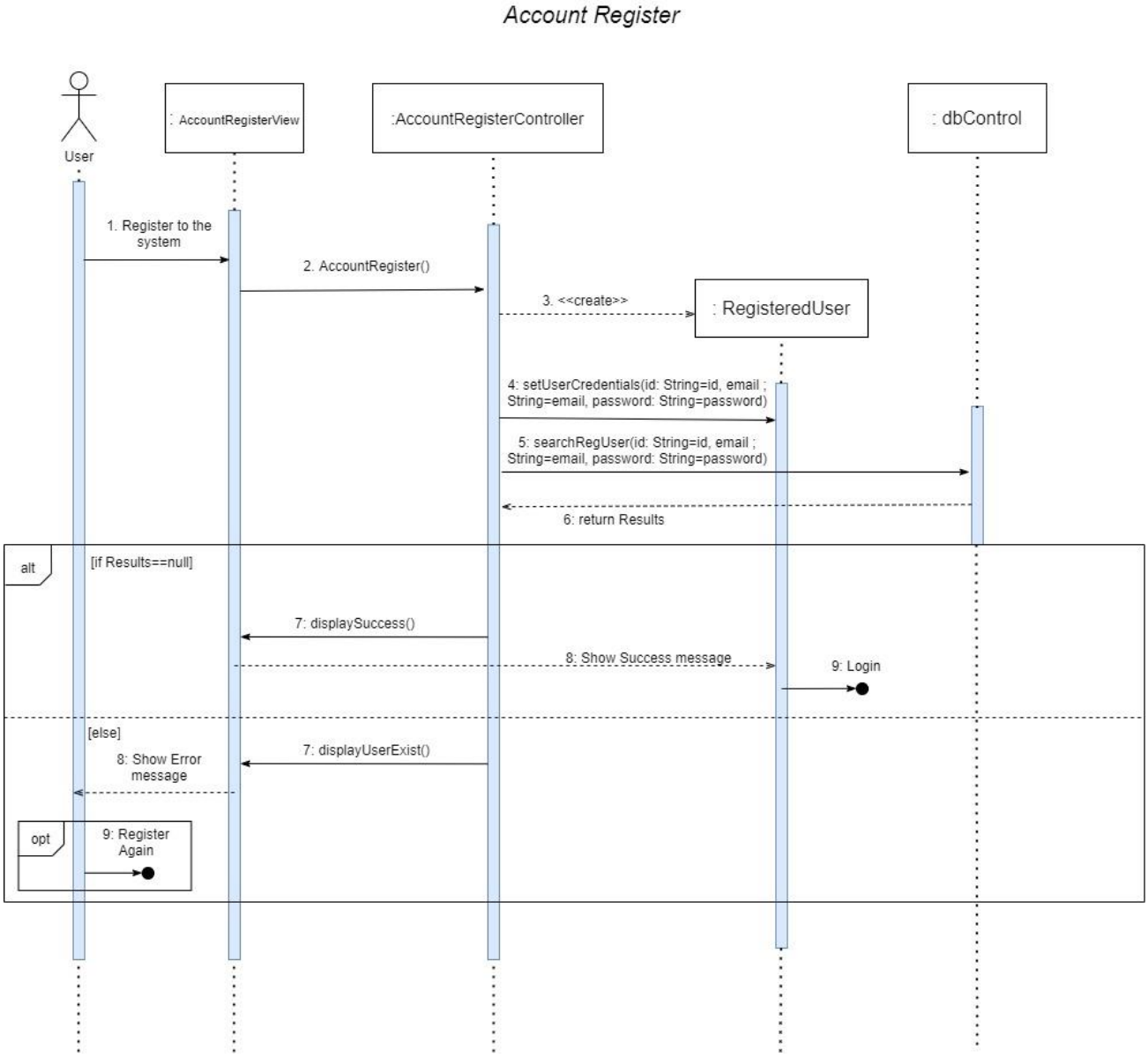
9) Give Alternative Solution’



Description:

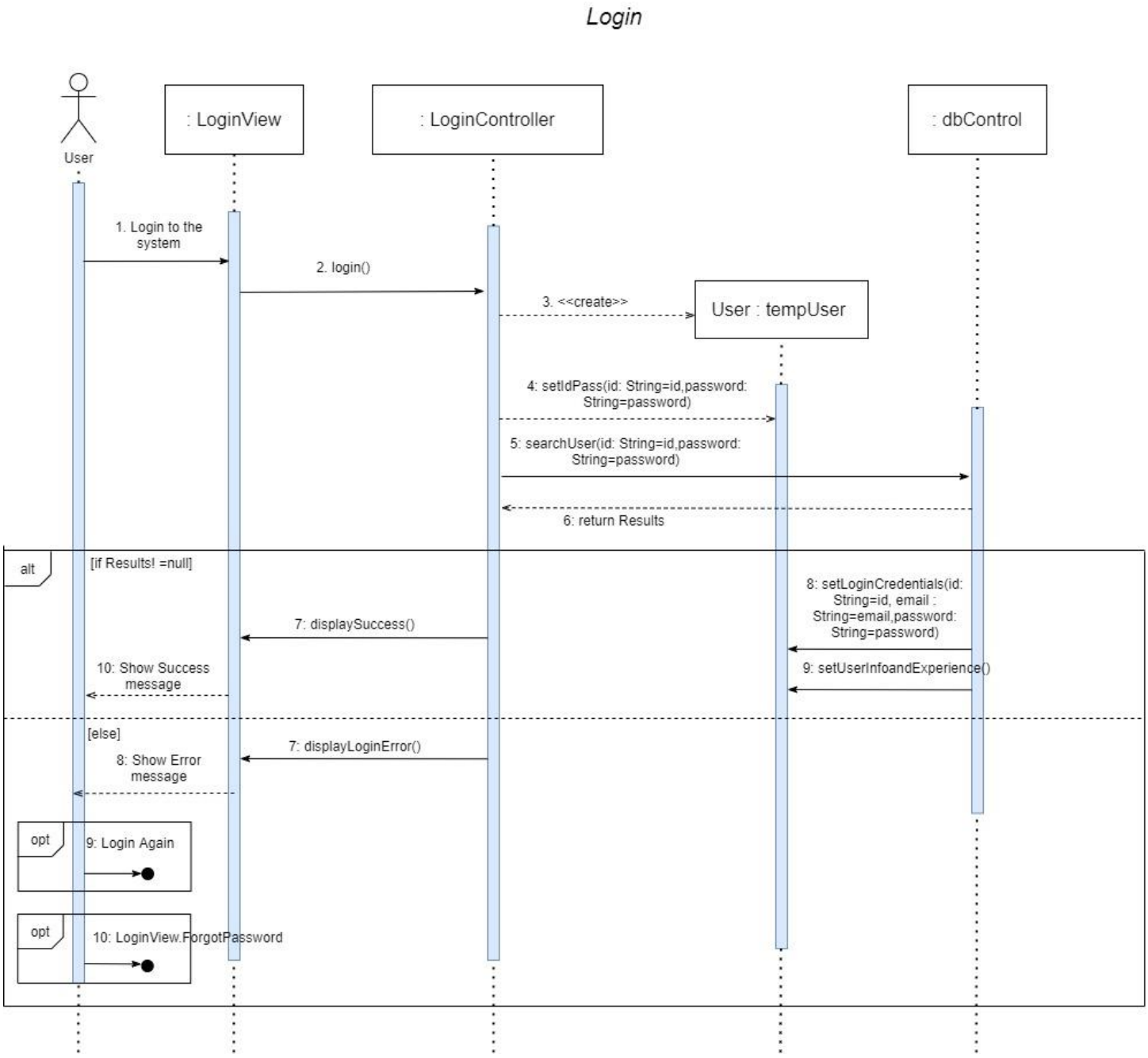
For alternative solution user can select the Give Alternative Solution option. Then the expert checks whether the user have consulted before or not. If the user hasn’t consulted before then the expert displays First Consult with expert. If the user has consulted before then the expert provides Alternative Solution to the user problem.

Sequence Diagrams: **(submitted by 20-43667-2)**



Description :

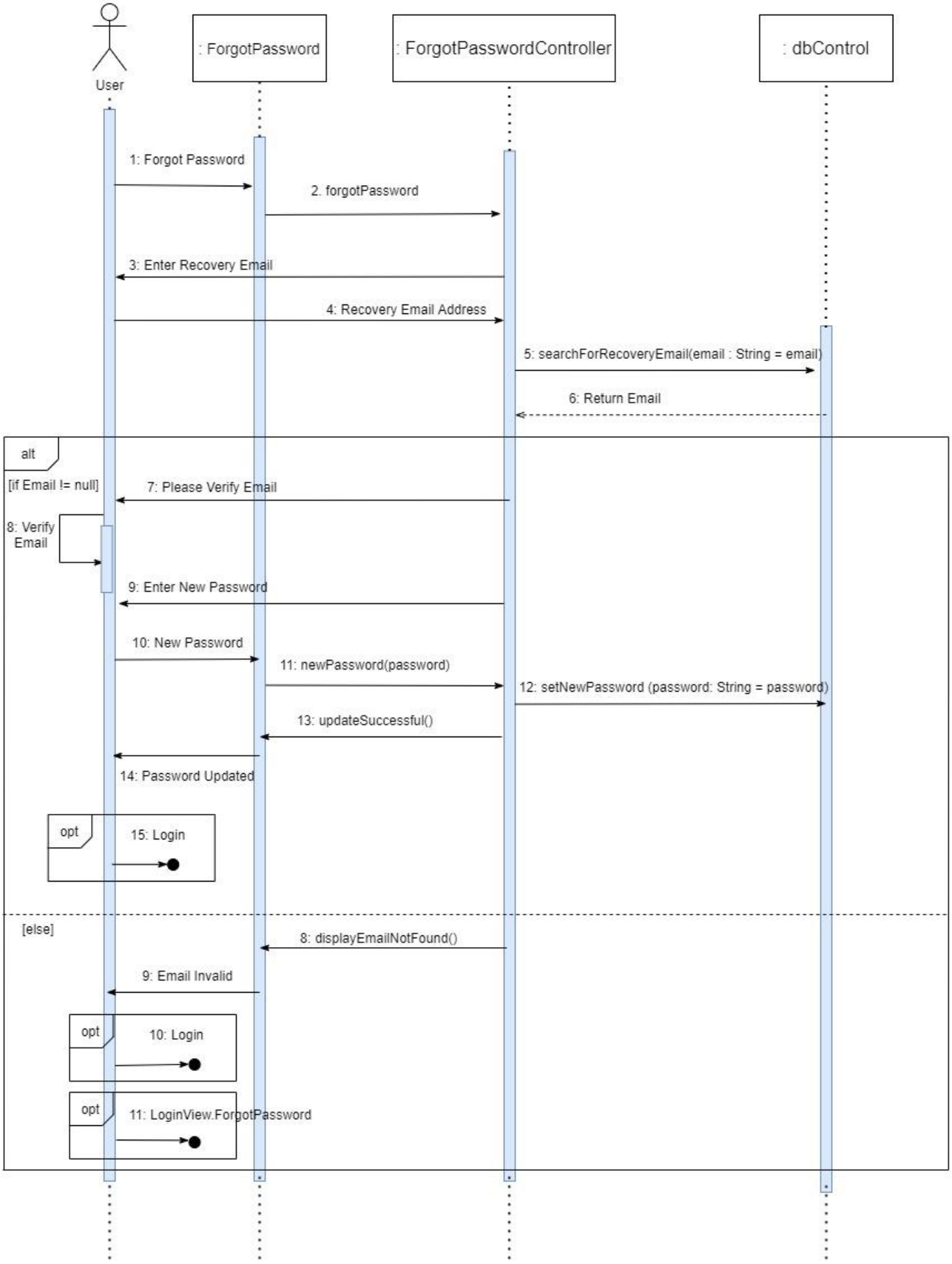
To register to the application a User has to select the Register to the system option. Then a temporary object called RegisteredUser is created with all the credentials the user gives to the application. The application then checks if there's any users with the same credentials. If not found, the application displays a success message and proceeds to the login option.
If there's already a user with matching information, application shows an error messege and gives an option to Register again.



Description :

To Login to the app the user must select the Login To the System option. Then a tempUser object is created which has all the login info provied by the user. The LoginController sets all the values to the temp object. The application then searches for the matching results. But matching result is found, the application sets all the information to the temp user object and shows him a success message. If the results are not found, a error message is shown and the user is given the option to login again or proceed to the forgot password section.

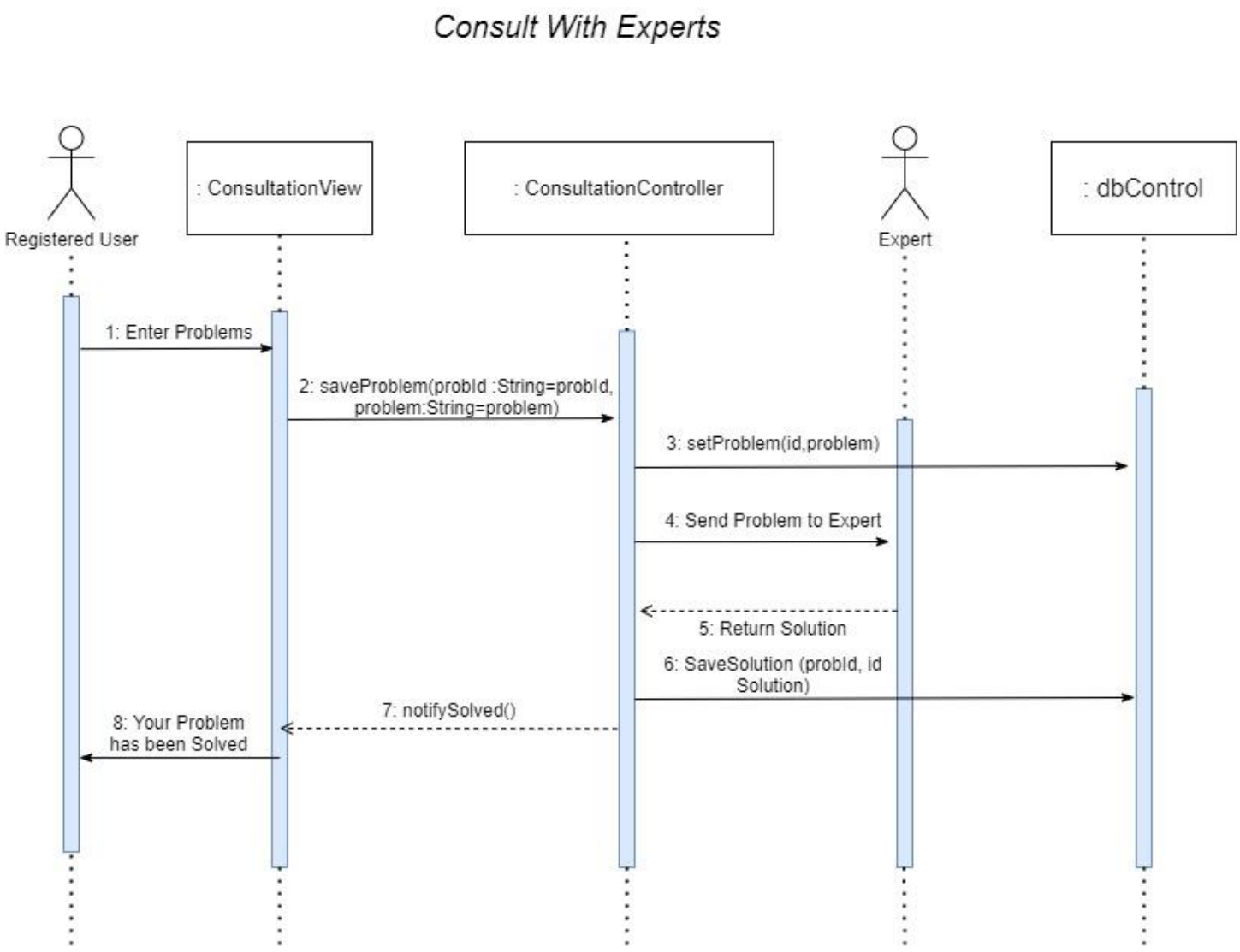
Forgot Password



Description :

The forgot password section helps if a user can't login successfully. After selecting the forgot password option the system asks the user to enter the recovery email. After entering it the ForgotPasswordController checks if that email exists or not from the database. If the email exists the user is given a link to verify and enter a new password from there. After entering the new password , the old password gets updated and a success message is shown. Then the user is given the option to login.

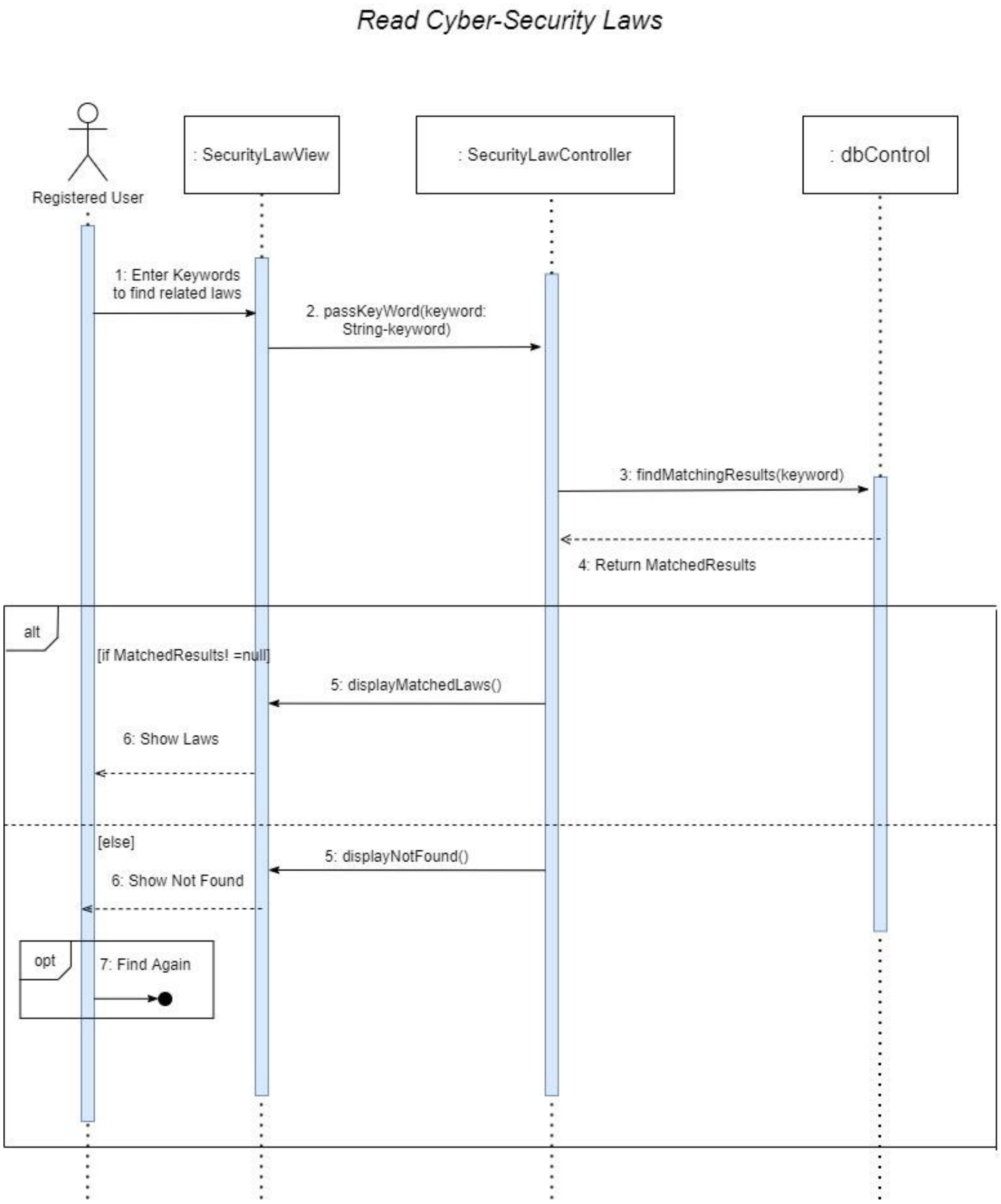
If the email is not found, a Email Invalid message is shown and user is given the option to login again or to go through the forgot password process again.



Description :

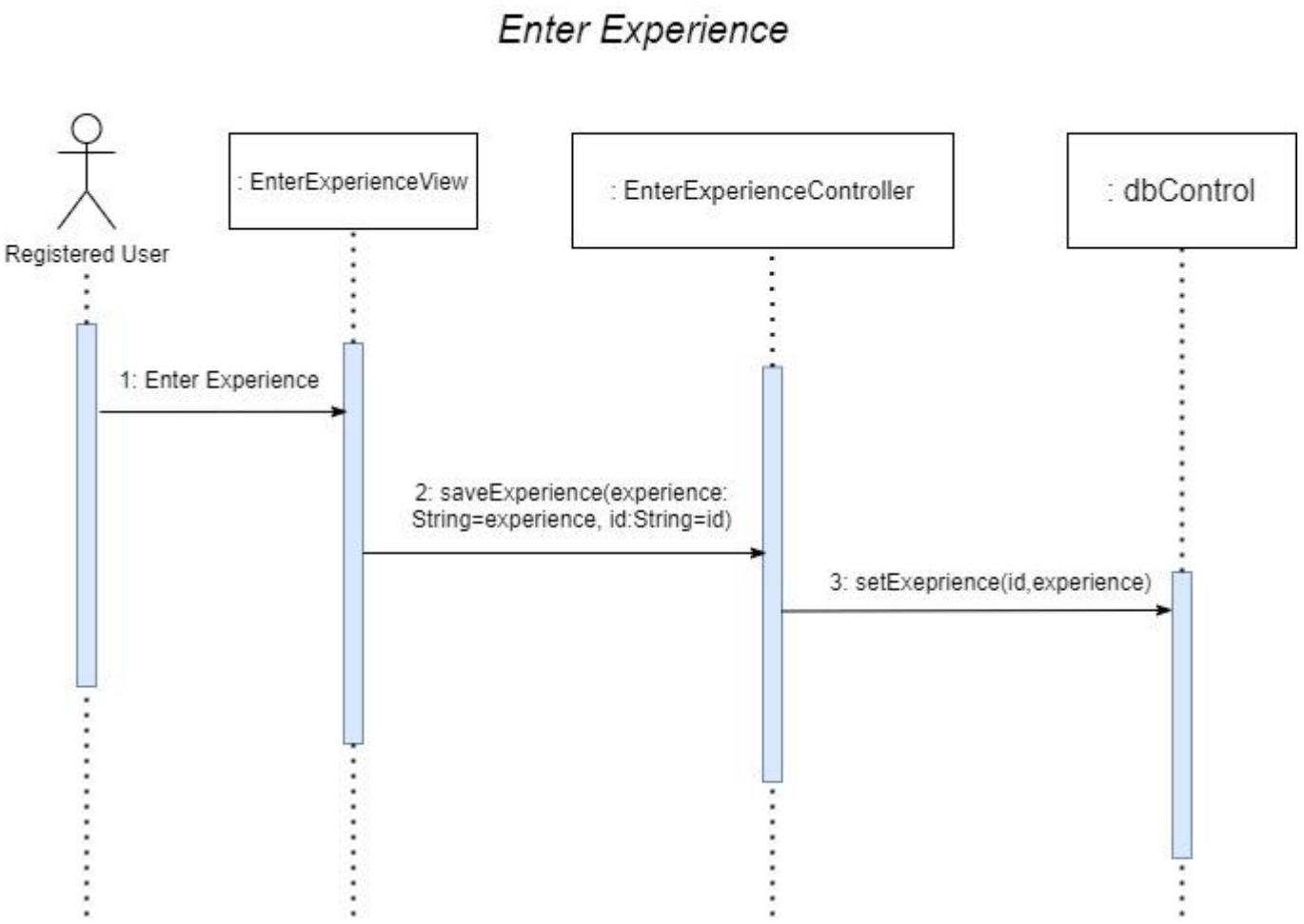
To consult with experts, a registered used has to Enter their problems first. The ConsultationController saves their problems in the database and also sends the problem to an expert.

The expert then returns a solution which also gets saved to the database. After saving , the user gets notified by a message that his/her problem has been solved.



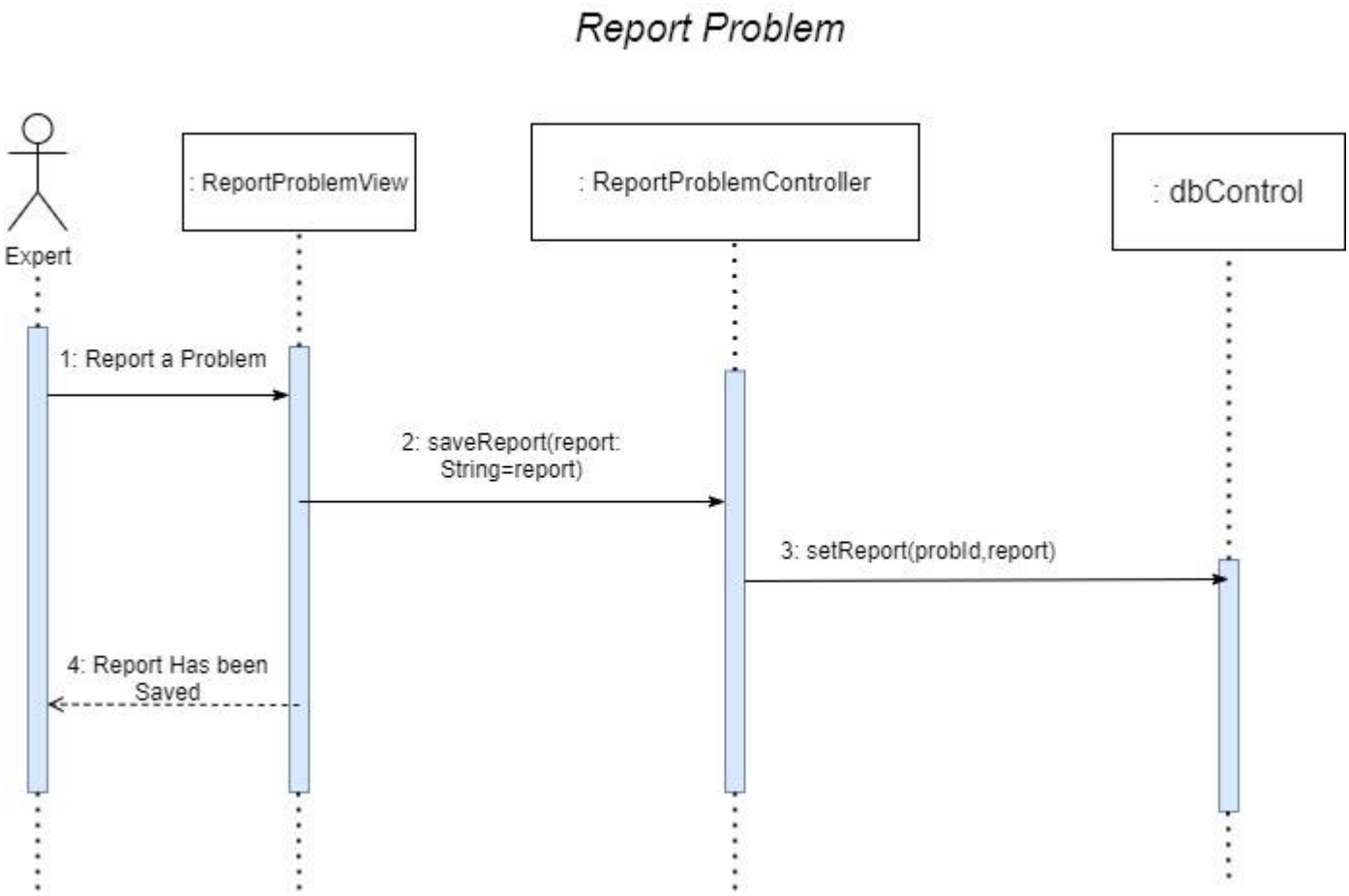
Description :

To read the cyber security law, a registered user has to enter one or more keywords to find laws about their related problems. After entering keywords the SecurityLawsController searches the database to find matching laws with the keywords. If matching results are found, it shows them to the users. If not found it shows a Not Found message and gives an option to find again.



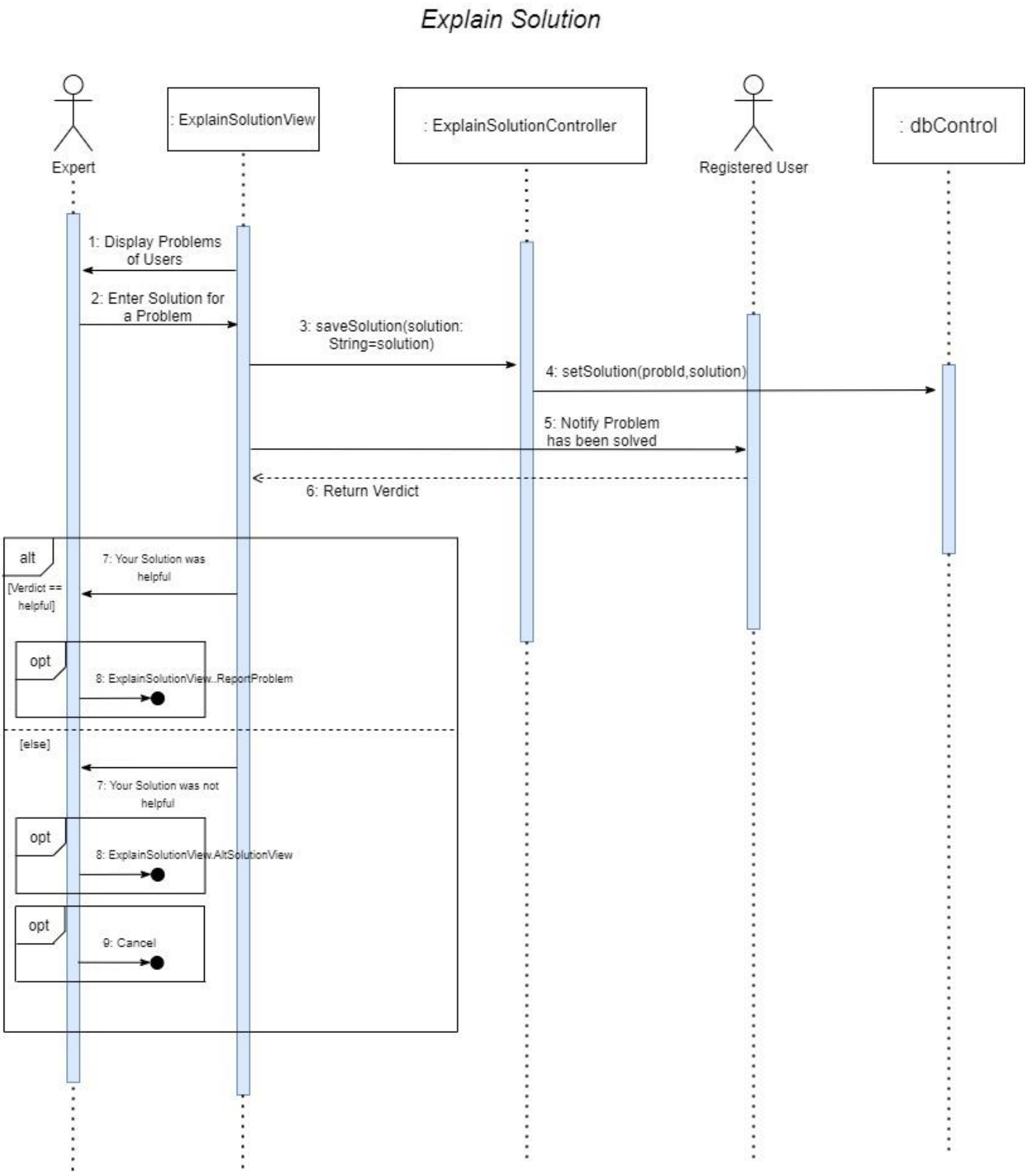
Description :

To share their experience, a registered user simply enters his/her experiences. Then the system saves them to the database with that users ID for later uses.



Description :

If any problem seems worthy of reporting, an expert can report them. He/She write and enter a report for any problem and the system saves it for future usage. After saving a report successfully, the expert is shown a success message.

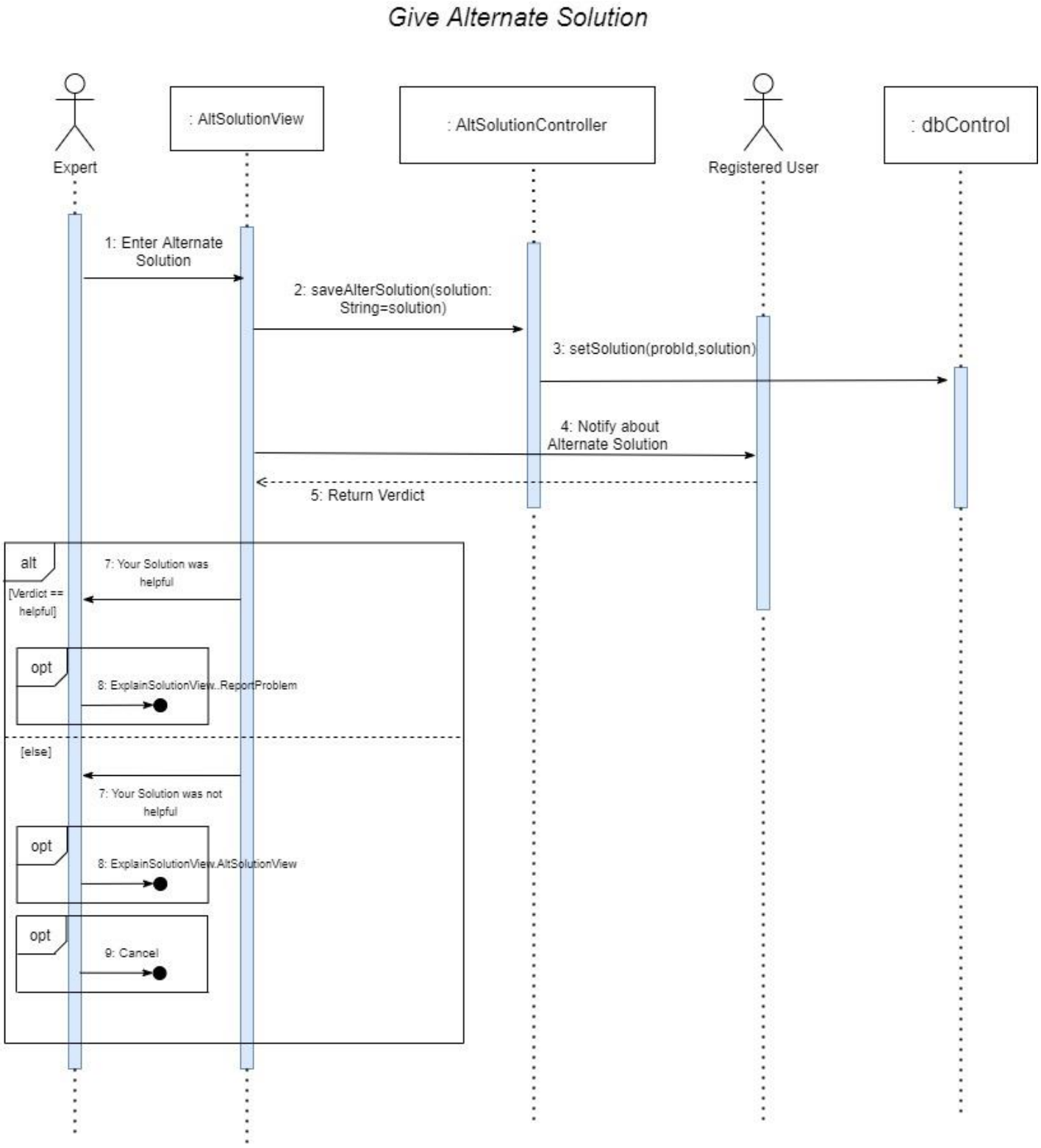


Description :

The ExplainSolutionView displays the problems of the users to the experts. The expert then enters a solution for a problem and it's saved in the system and the user gets notified about it. Then the user gives a verdict if the solution was helpful to him or not.

If it was helpful the expert gets a message about it and given the option to write a report of that problem if he wishes.

If the solution was not helpful to the user, the expert is notified about it and is given an option to provide an alternate solution or to cancel the solving process.



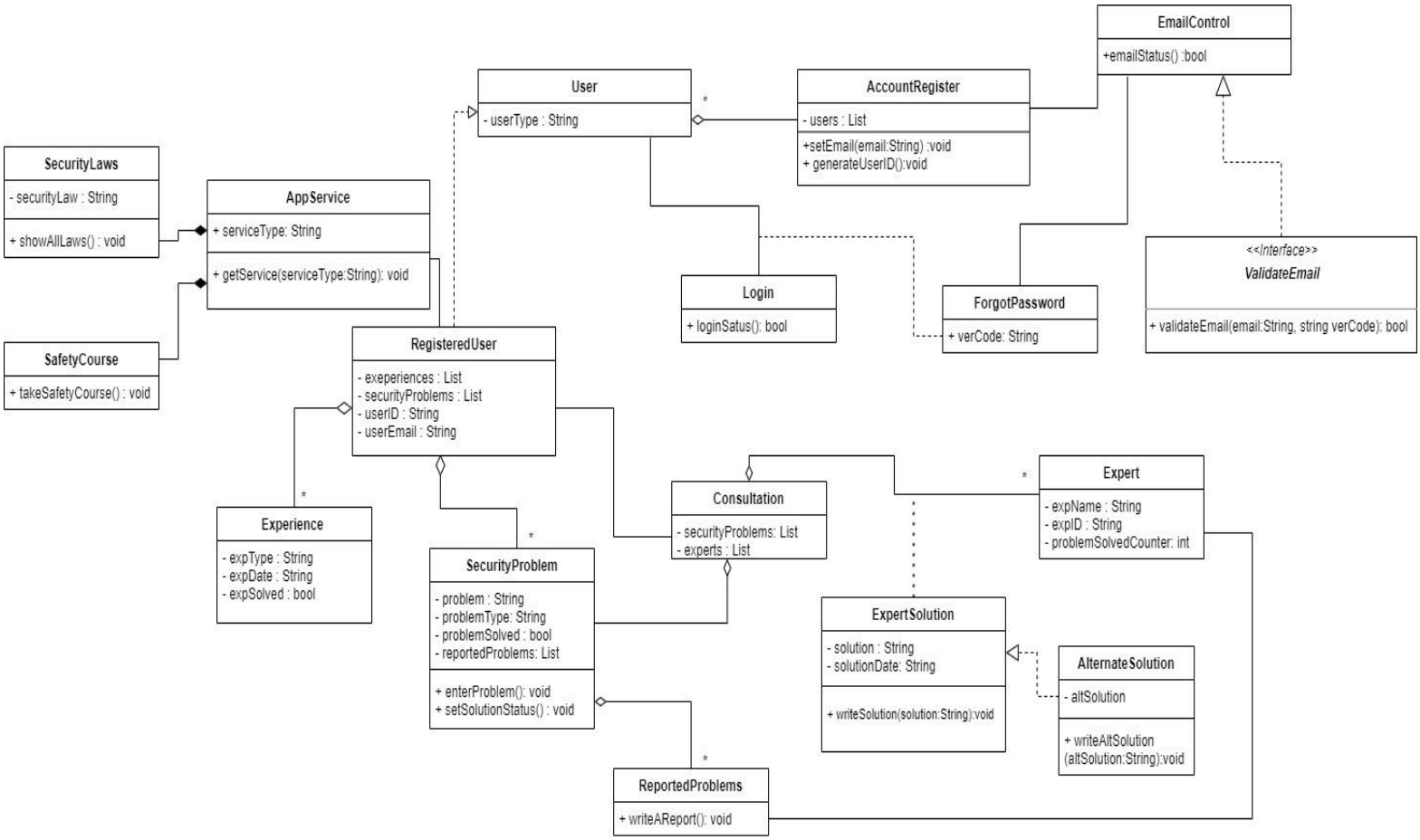
Description :

If an expert wishes to provide an alternate solution of a problem, he simply enters it. The system saves the alternate solution and the user gets notified about it as well.

If the alternate solution was helpful, just like before, the expert gets a message about it and given the option to write a report of that problem if he wishes.

And if the alternate solution was not helpful to the user, the expert is notified about it and is given an option to provide an alternate solution or to cancel the solving process.

Class Diagram: **(submitted by 20-43667-2)**



Description :

A user is associatede with the login class. AccountRegister class is used by a number of users who want to register to the application. Which is associated with a email control class that holds the ValidateEmail interface to verify the user's email to let him register successfully. There's a class called ForgotPassword to handle if there's any trouble login into the system. Which is also associated with the EmailControl class.

After registering a user becomes a RegisteredUser. Every RegisteredUser can have multiple number of experiences and SecurityProblems. RegisteredUsers are associated with the AppService class where they can find bunch of SecurityLaws and take a special SafetyCourse if the wish.

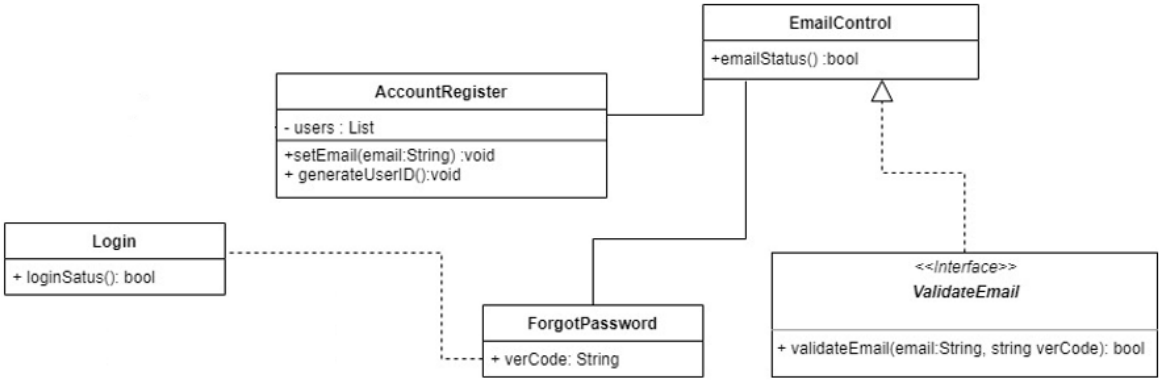
The Consultation class is associated with the RegisteredUser for their problem solving. It has multiple experts. The ExpertSolution class is a relational class which handles the solvings. Also there's one AlternateSolution class to process if there's any alternate solution for a problem. Some problems are reported by the experts and they are held by the ReportedProblems class.

Utilization of Software Design Principles and Patterns:

In our system, we have implemented numbers of principles and patterns. For the principles we implemented, they are Open-Closed Principle (OCP), Liskov Substitution Principle (LSP), Dependency Inversion Principle (DIP) and Law of Demeter (LoD). For the patterns we implemented the Factory Pattern.

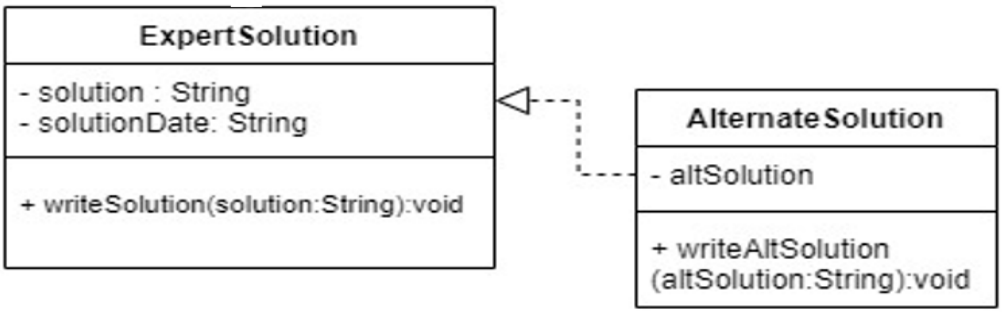
1. OCP : It states that the entity is open for extension but closed for modification. The validate email class is set to be an interface. Where there are many classes connected through it. There is email control class it will check email status which is connected to forgot password class after that there is account register class where another class in connected called login which will check login status after all the assessors of attributes are set to private in account register class, where it will check user list. Other classes are not allowed to access the attributes. Then, when we need to modify the code, code is required to be change is within the class itself.

Class Diagram (extracted):



2. LSP: As you can see Sub-classes(ExpertSolution and AlternateSolution) of parent class (expert) are completely substitutable and replaceable. In the diagram you can see their strong behavioural subtyping lies in write solution and write altsolution both have common target which is solution.

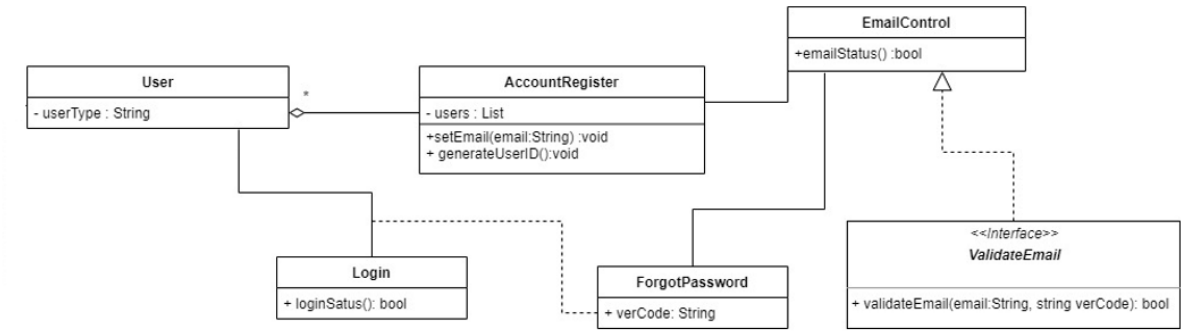
Class Diagram (extracted):



3. DIP: In the RegisteredUser class, one RegisteredUser class depends on the validateEmail Interface rather than the concrete subclass of User. This can be achieved by applying the polymorphism. With this design, DIP provides a better way to extend the function.

4. LoD: In the RegisteredUser class, it will manage its own Experience and SecurityProblem class. The assessor of the Experience and SecurityProblem object is private. Also, there are no getter and setter for that object. This is called object encapsulation. With encapsulation, other classes cannot directly access the Experience and SecurityProblem class. LoD can be achieved by using object encapsulation.

Factory Pattern :



- Product (ValidateEmail): Defines the interface of objects the factory method creates.

- ConcreteProduct (EmailControl and ForgotPassword): implements the Product interface.

- Creator (User): Declares factory method which returns an object of type Product(Login). Also, may define the factory method to create a Product(ValidateEmail) object.

- ConcreteCreator (AccountRegistered): Extends and overrides the factory method to return an object instance of ConcreteProduct (EmailControl and ForgotPassword) upon request

System Prototype:

1 : Front page which will load in the beginning -

Figure 1: App loading page

2: Login page for user -

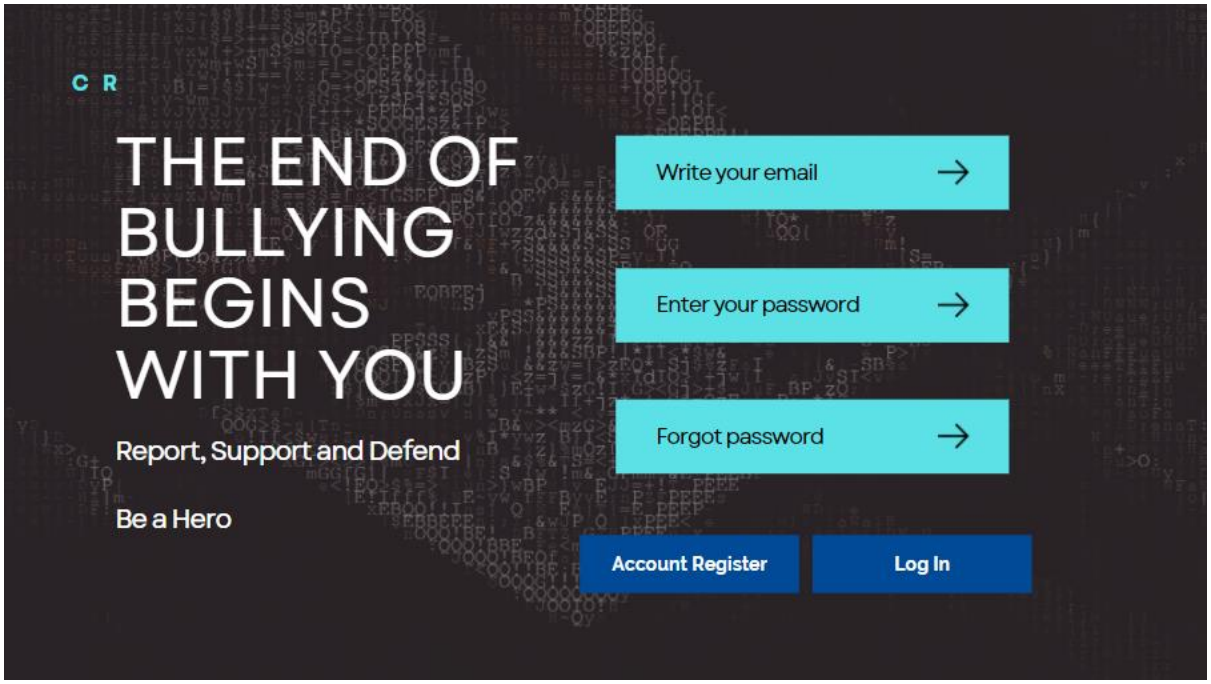


Figure 2: Login page

3: Verifying password for logging in or showing error display -

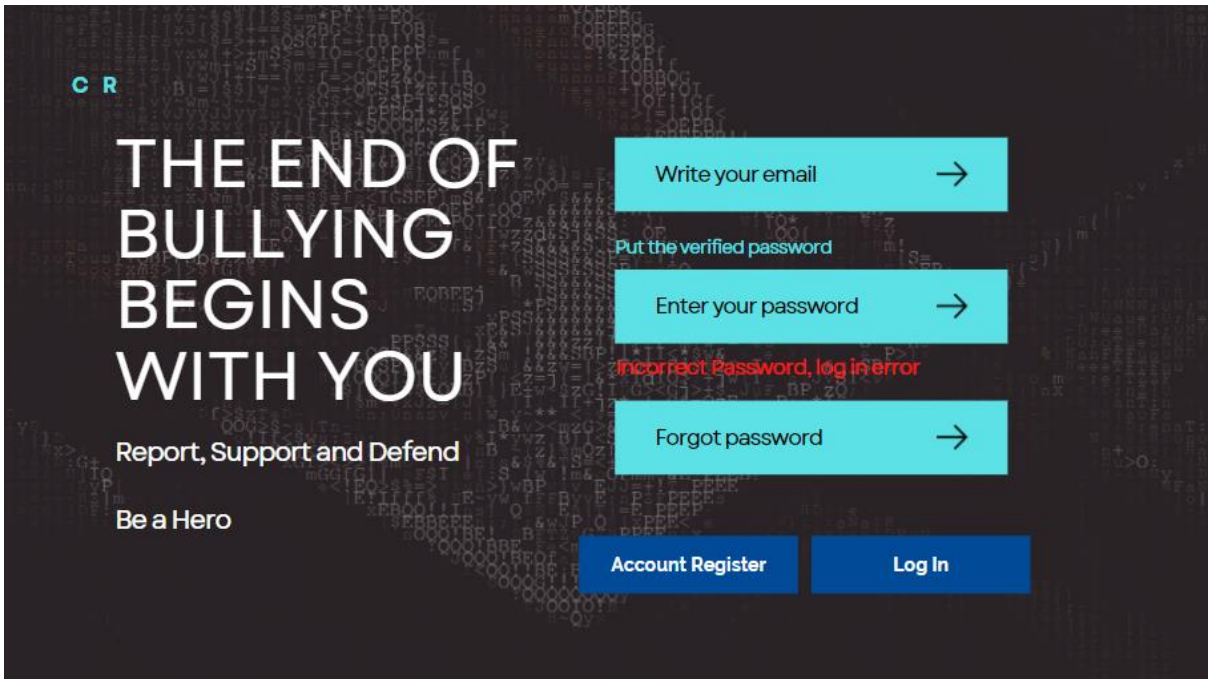


Figure 3: Login page (error display)

4: Forgot password page for users who doesn't recall their existing password -

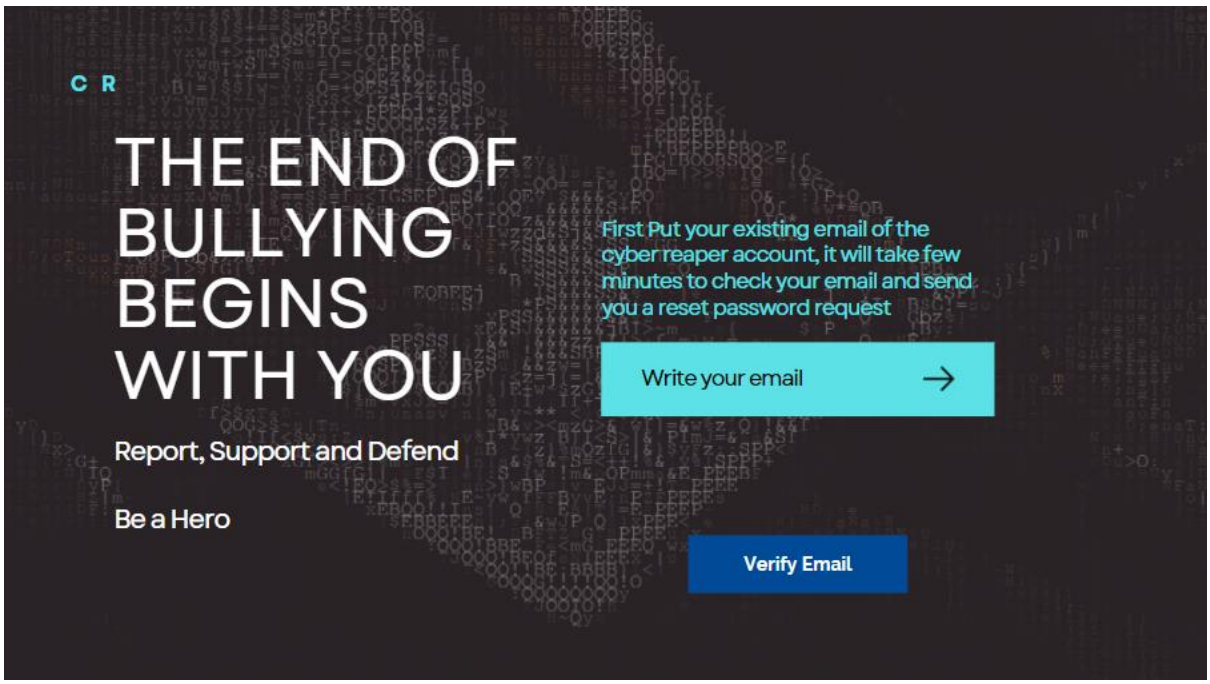


Figure 4: Forgot password page

5: Verifying email for forgotten password or showing error message -

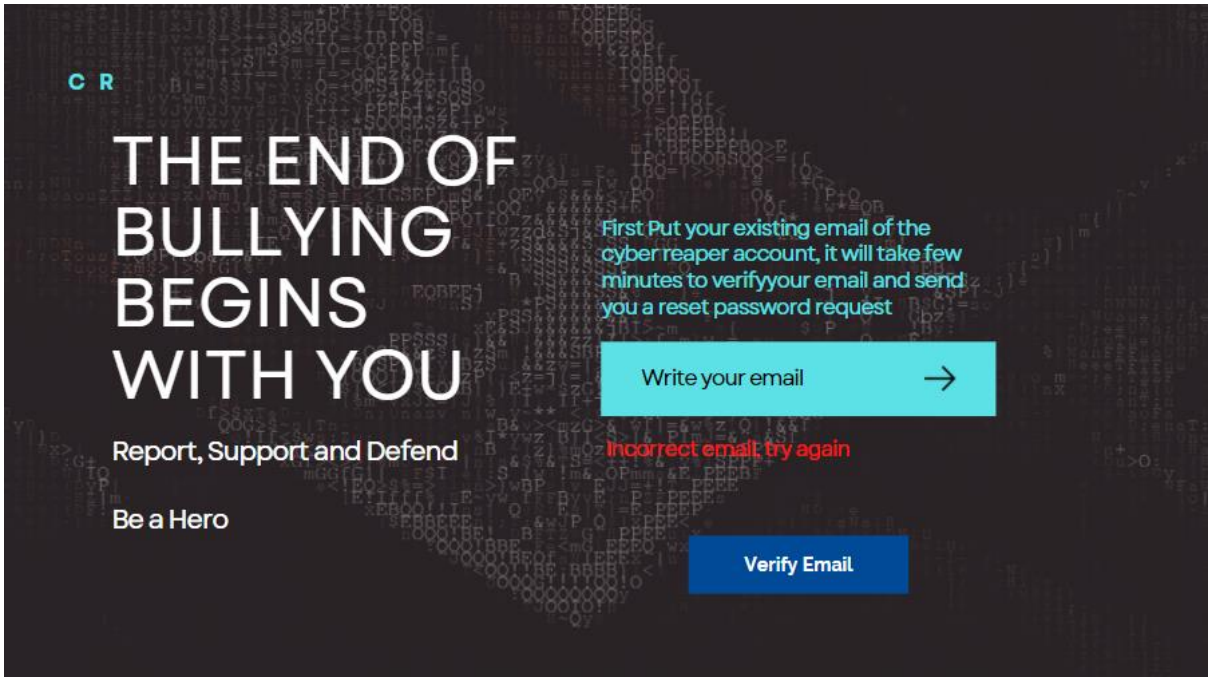


Figure 5: Forgot password page (error message)

6: Entry page for registered user -

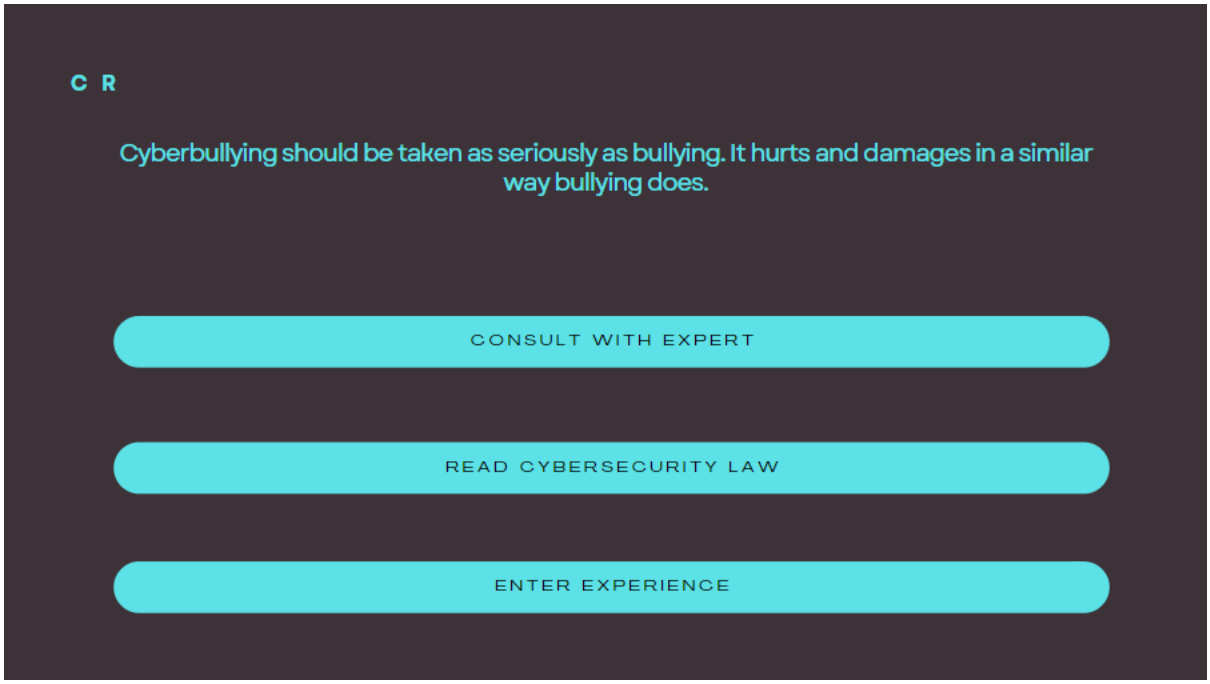


Figure 6: Register user's entry page

7: Page for consulting with expert -

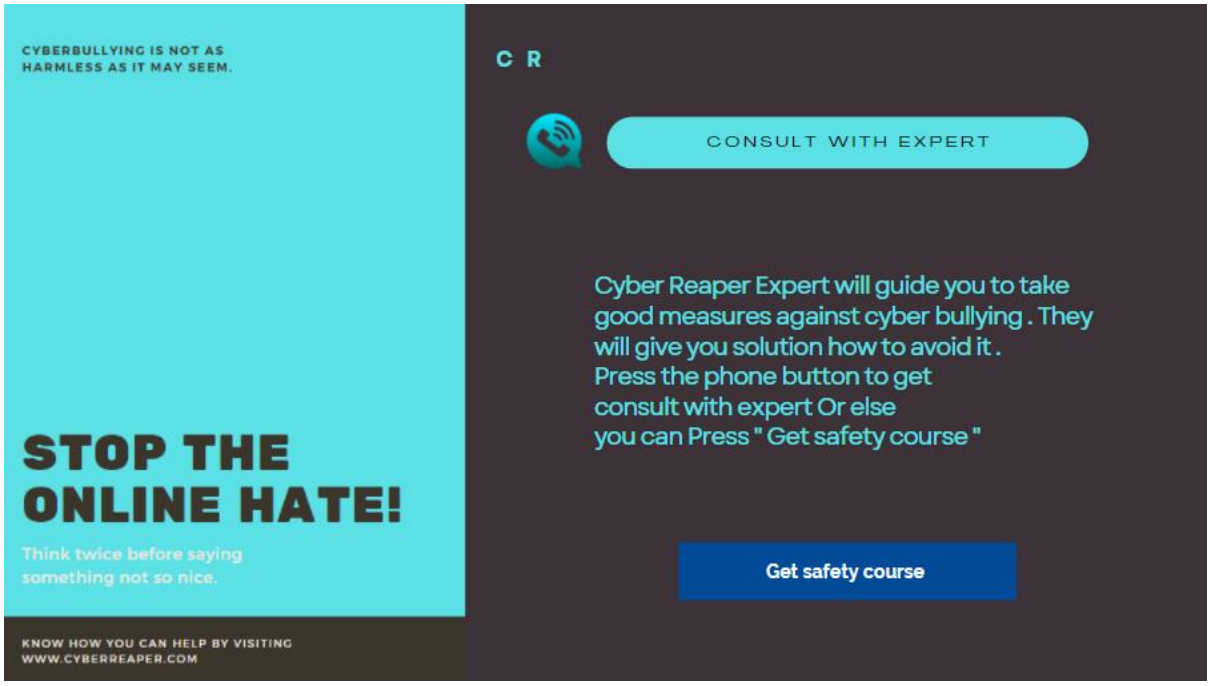


Figure 7:Consult with expert page

8: Expert user's page for helping the registered user -

Figure 8: Expert user's page

Conclusion

In this report, we have included the Use of “Cyber Bullying Prevention Management” by an app called “Cyber Reaper”. This report demonstrates our solution in order to solve the existing Cyber bullying problems and its solution.

References

[1] Belsey, B. (2004). What is cyberbullying? Retrieved April 4, 2009, from: www.bullying.org/external/documents/ACF6F8.pdf

[2] Cook, C.R., Williams, KR., Guerra, N.G., & Tuthill, L. (2007, September). Cyberbullying: What it is and what we can do about it. NASP Communique, 36(1), n.p.

[3] Lenhart, A. (2007). Cyberbullying and online teens. Pew Internet & American Life Project. Retrieved April 2, 2009, from: www.pewinternet.org

[4] Group_28_FinalReport(Sample)