

‘SOLVESTAR’

A Phone Application

A Software Project Submitted by

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August, 2017

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A software project (SP I), submitted to the Department of Computer Science of the Faculty of Science and Information Technology, American International University – Bangladesh in partial fulfilment of the requirement for the degree of Bachelor of Science in Software Engineering.

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DECLARATION

This is to certify that this project is our original work. No part of this work has been submitted elsewhere partially or fully for the award of any other degree or diploma. Any material reported in this project has been properly acknowledged.

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APPROVAL

The project titled “SOLVESTAR - A Phone Application” has been submitted to the following respected members of the board of examiners of the Department of Computer Science, American International University – Bangladesh [AIUB] in partial fulfilment of the requirements for the degree of Bachelor of Science in Software Engineering on August 20, 2017 and has been accepted as satisfactory.

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PROJECT SUMMARY

For the past few decades information and technology has spread through all over the world and playing a major role in the life of human beings. 'Information Age' is what we are talking about. In most of the cases our life depends on the information that we gather. Internet is leading the race so far. It is a powerful source for gathering knowledge. Such as people are using several social media, educational sites, learning community sites and applications and so on. But some time people do not get the actual information that they are seeking. It is also hard to predict that the sources will be reliable. That is why people are facing difficulties. Especially in educational sector students and others are facing these often. We know that there are lots of institutions in the world which are providing knowledge and information to all kinds of students. But in this modern time that is not enough. That is why some several companies and startups are doing some incredible things by providing their helpful services. We have seen that most of them has created some online learning community where students can go and seek for their information. There are lots of experts and consultants who are associated with these sites to help the students. So, we can say that these sites are the bridge between the consultants and the students. Furthermore, using these sites and applications are not that difficult to use. Moreover, most of these are available both as websites and phone applications. This project also provides the same services. Its main goal is to give the actual knowledge and a proper guidance to the information seekers. Finally, we can say that these type of applications are a great platform for gaining knowledge.

CHAPTER 1

PROJECT INITIATION

1.1 Background of the Problem

This document is the design report for an online learning community phone application. This will help to provide an insight to the whole system design and implementation of the system.

This software has the following five main components:

1. Implementation for two different types of users: Administrators and Basic Users.
2. Implementation of post submissions, post acceptances and notifications.
3. Management of user posts and user profiles.
4. Points and ranking procedures.
5. Implementation of communication and collaboration.

This design document mainly consists of Activity Flow Diagrams, Use Case Diagrams, Block Diagrams, Class Design and Architectural design.

The main purposes of this design document are listed below:

1. Precise understanding of the requirements and constraints related with the programming language, and User Interface.
2. System decomposition into manageable units or modules
3. Abstraction of the system implementation with the help of classes.

This report is the result of the design phase. The class diagrams and activity provide a schematic representation of the various classes used and design flow respectively. The diagrams were prepared using **Creately.com** web tool. The Consolidated Activity diagram provides a model to visualize the flow in the system as a whole. The class diagrams also hold the data structures that would be used and also their data types.

We are implementing the system on the android platform using JAVA, XML programing language as front end developments, JAVA for back end and business logic and PHP programming language for server sites. MySQL server for database.

1.2 Purpose / Objectives

The purpose of this project is to create a functional phone application for the students who will be able to ask any types of knowledgeable question that they are seeking and in return they will get the exact results that they are seeking from various experts and consultants. Users of this phone application will be able to create an account which will supply them with an easy to use interface in order to post questions and also for giving opinions on others post. The basic requirements state that the users will be able to securely register and manage their profiles. They will also be able to navigate through other posts by category and by using a well-executed search function. There will be a point mechanism for each post submission, giving opinions on others post, post acceptances, getting thanks and disagrees and spam and invalid posts. There will be a web portal which will be maintained and managed by administrators. They will have the authority to approve and reject user requests and user post management. The administrators will monitor user actions and manage spams and other reports for security concerns.

CHAPTER 2

ELICITATION

2.1 Existing System Review

In the following section we present an online learning community service business that use more than variations of recommender system technology in their phone application. For each variation, we give a brief description of the features of the system.

2.1.1 Review Brainly.com

Brainly is designed to achieve easy and fast online learning system. They provide user login system, post management, high collaboration, member ranking system, search, point management and user management.

2.1.1.1 Feature List

1. Search

Brainly has a search tool for users to search for question, posts, answers and users.

2. Post Submission

Brainly offers a submission form from which they can post anything and ask anything to the experts.

3. Answering:

There are some several experts and consultants are associated with this app. They are most of the time available for answering questions. It is a very fast process. After submitting a post the result will be delivered in few minutes.

4. Point System:

Brainly provides point system for each valid questions, answers on the order of correctness.

5. Profile Management:

Users can manage their profile if they want.

6. Collaboration:

Brainly app has an internal messaging and communication system. Users can interact each other through this service.

7. Review and Feedback:

After some usage Brainly asks for system reviews and feedback to the user.

2.1.1.2 Rank: 4.5 / 5

We would like to rate this app 4.5 out of 5. It does provide some good features like:

- a. Post Categorization.
- b. Point Mechanism.
- c. Collaboration.
- d. Fast and efficient results.
- e. Top weekly users.

2.1.1.3 Limitations

Though Brainly offers really cool features but in our perspective it has some disadvantages for the users. Such as it does offer post submission feature but it does not provide image posts as a question and again image post as answers. Plus there are no scope of accepting any answer or marking any answer as correct to that user perspective.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Scope

For this project we want to define what will be done such that the final product meets expectations. With this in mind, the following are the parts that will be completed:

1. Secure registration and profile management facilities for users.
2. Users do not need to register every time to see the user posts and also for ask questions.
3. Adequate searching mechanisms for easy and quick access to particular questions, posts and users.
4. New posts will be displayed every time in the home feeds.
5. Post statuses will also be shown as well as the accepted answer in each post block if there any.
6. Implementing a very efficient post submission form with image as post service.
7. View notifications along with the access to the corresponding post block.
8. Real time messaging service implementation.
9. Monitoring services for several reports and message and post spams.
10. Moreover keeping the system up to date in all types of data and information of posts, users and other stuffs.

In addition to the above mentioned basic functional requirements for the project, we also plan for the following supplementary requirements as well. We will provide a ranking system for the users based on their points. High ranked members will be recognized and mentioned in weekly and monthly events.

We also plan for a feedback mechanism for posts, answers and overall usage of the system. And for this there will be a web portal where administrators will control everything and also do the monitoring.

For maintaining the robustness of the system and also for the safety of customers we will ensure following in the project:

1. The application will be more user friendly to fulfill user expectations.
2. The system should be easy to maintain. We will be using object oriented programming techniques.
3. Customer details will be secure from outside intruders.
4. The system will remain up at all times. The hardware and software should be robust and will be tested extensively.
5. Users will get the best user experiences by using the application.

3.2 User Documentation

UD-1: The system shall provide an online hierarchical and cross-linked help system in HTML that describes and illustrates all system functions.

UD-2: The system shall provide a user manual and tutorial videos online.

- UD-3: The first time a new user accesses the system and on user demand the system shall provide a demo of the application, to allow users easily get into the application.
- UD-4: There will be option to send any complain, report or suggestion about user experience for improving the application.
- UD-5: The system shall provide a help desk called which will be available 24/7.

3.3 User Roles

The system will be containing following users. Each user has unique roles and responsibilities:

3.3.1 Requirements for Basic Users

1. Basic account features are required for the basic users. This includes:
 - a. Registration
 - b. Login, Forgot/change passwords
 - c. "Account Details" section containing contact details.
2. Browse and Search: User should be able to browse through the questions, posts and user names.
3. Post Submission: User can post for anything on any topics they want. They just have to ask the question.
4. In addition to providing the above mentioned submission feature, user should also be able to post images if they want.

5. Edit profile: User should be able to manage their profile.
6. Notifications: User will be notified for each events in which they are connected.
7. Comment / Answer: User should be able to give their own opinions, answers, comments, and replies on other posts.
8. Messaging: User should be able to experience the internal messaging service of the system.
9. Points: User should get points for their each and every post related activities such as posting questions, giving answers, getting accepted answers also they will lose points if they break any rules and regulations of the system as well as gets the disagreement of their answers.
10. Report: User can deliver a report on anything unusual they experience.

3.3.2 Requirement for Administrator

1. Update/modify User Information.
2. Monitoring user activities and keeping track of its status.
3. Administrator can delete user profile.

In addition to the above mentioned Administrator can do everything a user does.

3.4 Use Case Diagram

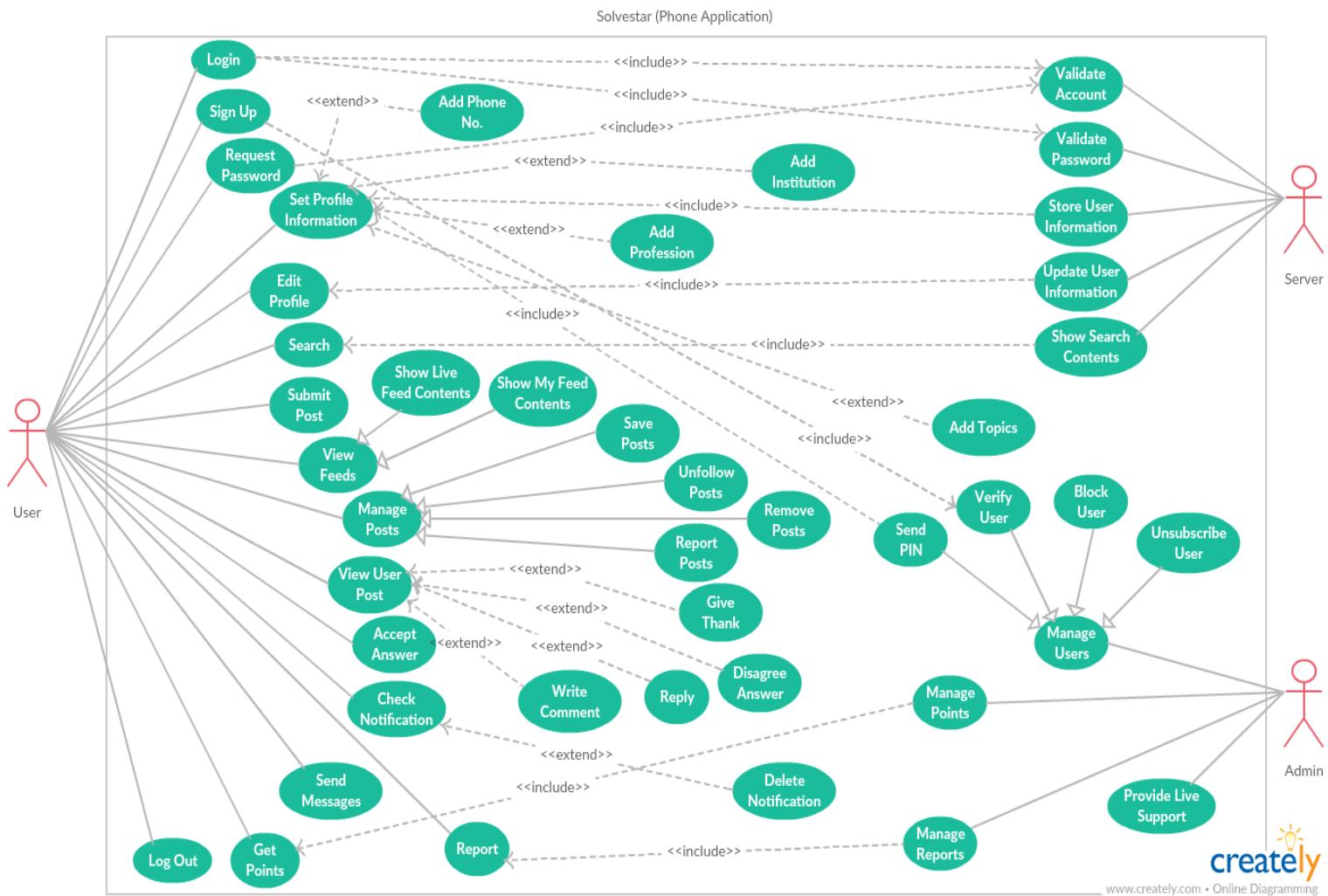


Figure 3.1: Use Case Diagram for Solvestar Phone Application.

3.4.1 Use Case Specification / Narrative

For Basic Users

A user will be able to set their personal information and also can edit them any time they want. They will be able to search for a particular problem, question or even they can search for another user. They will be able to see other user posts and also can share their own opinion on those. They can submit their own post and will also be notified if they gets any reply or other post related events. By their activities on posts they will be rewarded with some points. They also can communicate with other users. If they face any unauthorized events, spams or something unusual they can simply report to the admin.

For Administrator

An administrator has more privileges than regular user. Main functions of an administrator will be the management of customers. Administrators can view, modify and delete the personal information and passwords of members if necessary. They would also be able to search information about members. That means they have the privileges to access the whole internal system.

3.5 Product Perspective

This system consist of three parts:

- i. Phone Application
- ii. Database Server
- iii. Web Portal

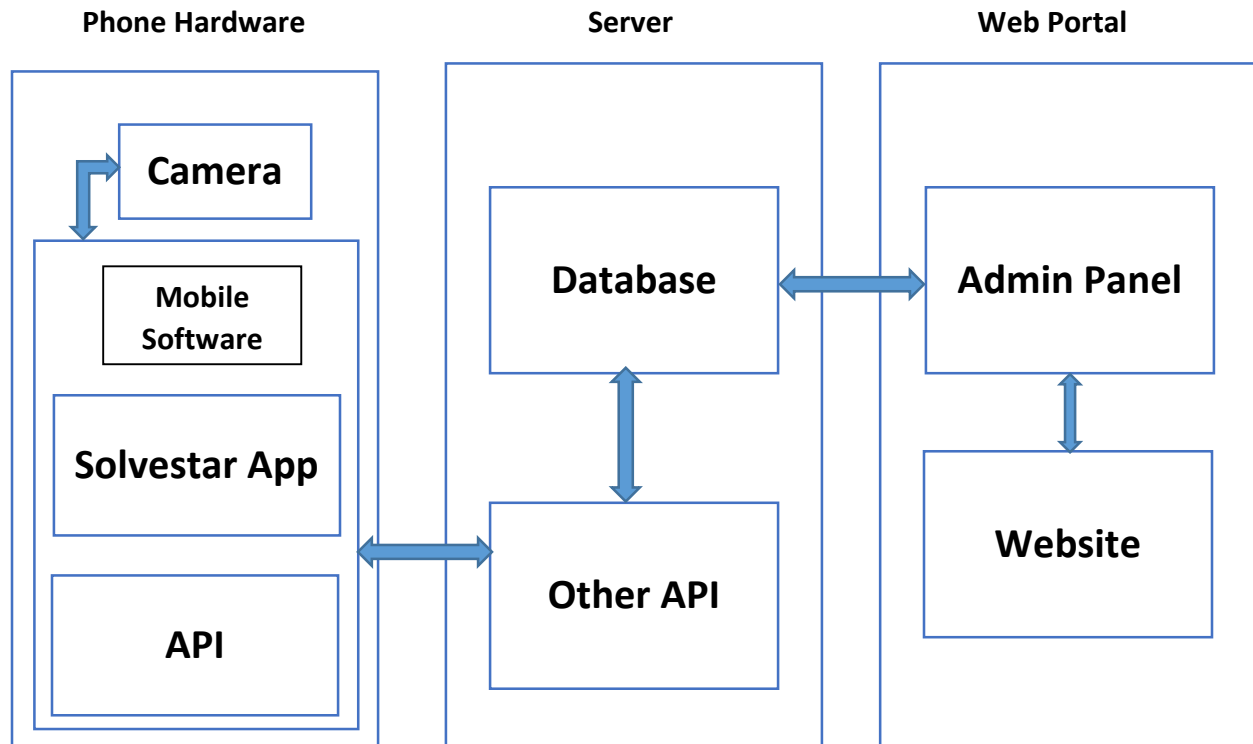


Figure 3.2: Block Diagram of Solvestar Phone Application.

Phone Application: The software itself from where users get the best experiences of this applications services. The phone application will need to communicate to the camera within the phone, which will be helpful for image posts. The functionality provided by the Camera will be embedded into the application in order for the user to be able to use the functions in the application in a seamlessly manner.

Database Server: Since this is a data-centric product it will need somewhere to store the data. For that, a database will be used.

Both the phone application and web portal will communicate with the database, however in slightly different ways. The phone application will only use the database to get data while the web portal will also be able to add and modify data. All of the database communication will go over the Internet.

Web Portal: A web platform will be provided for the administration panel. We can say that this system will also consist of another external users who are considered as admins of the whole system. Their working processes will be executed on the back end which are normally invisible to the normal users. They have the control of everything. Administration panel will monitor all the time to protect all the information from spam users and unauthorized events. Any type of unexpected occurrences will be handled and maintained by the panel.

3.6 Design and Implementation Constraints

- CO-1: Only the verified users will be able to use the application due to the verification process of administration.
- CO-2: This Application will be available only for Android and later on IOS. Any android phone supporting Jelly Bean will be able to run the application.
- CO-3: The internet connection is also a constraint for the application. Since the application fetches data from the database over the internet, it is crucial that there is an internet connection for the application to function.
- CO-4: Both the web portal and the mobile application will be constrained by the capacity of the database. Since the database is shared between both application it may be forced to queue incoming requests and therefore increase the time it takes to fetch data.
- CO-5: This application will only available in English language.
- CO-6: Application itself will ensure the total security of user data.
- CO-9: To avoid problems with overloading the operating system the application is only allowed to use 20 megabytes of memory while running the application. The maximum amount of hard drive space is also 20 megabytes.
- CO-10: Development of the application will have to maintain the java documentation standards and conventions for Android.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Architectural Design

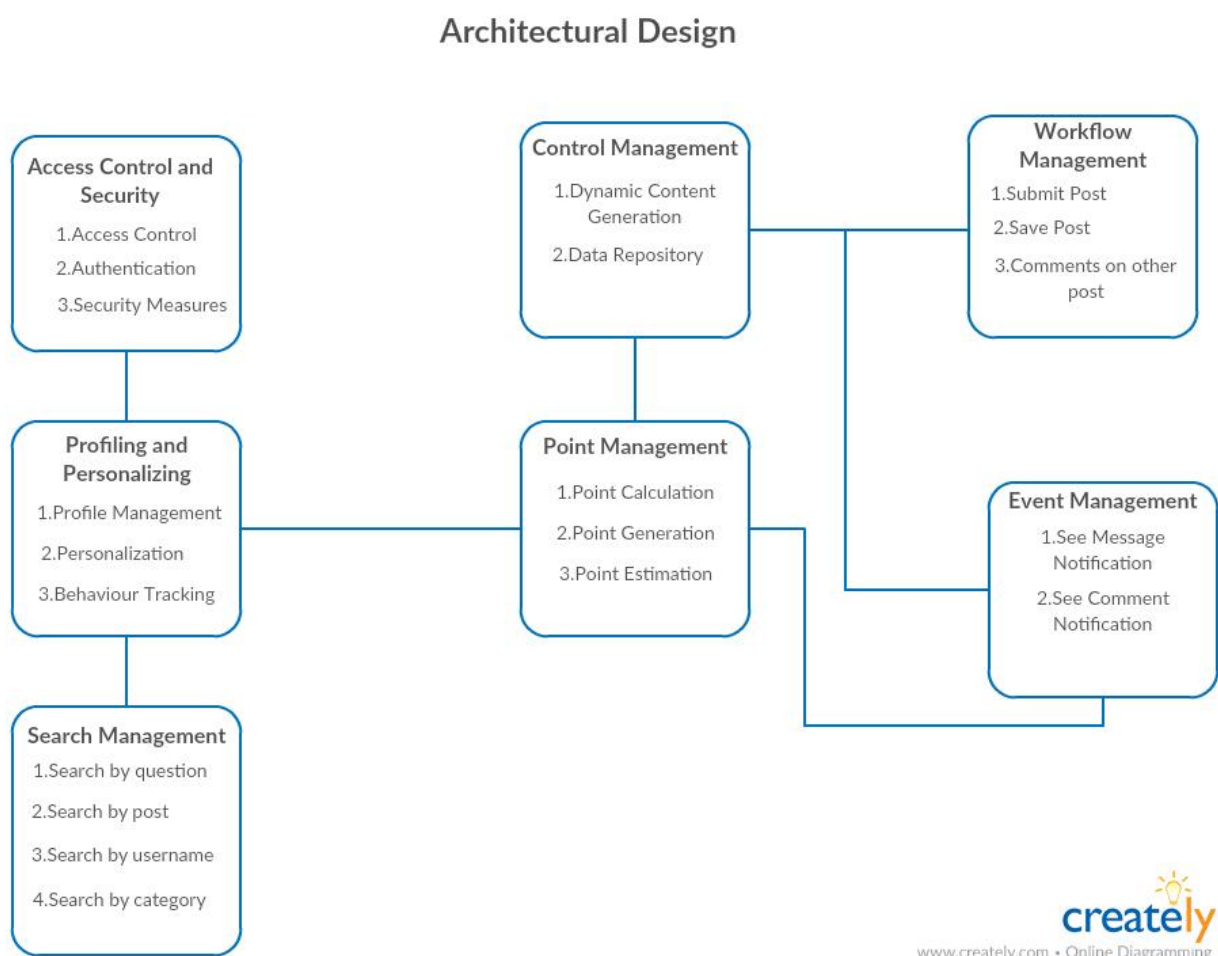


Figure 4.1: Architectural Design for Solvestar Phone Application.

4.2 General Constraints

All the resources needed are provided below.

Hardware:

The following hardware configurations are required for a Mobile Phone to Solvestar application:

1. Minimum Dual Core CPU 1.2 GHz speed & for improved and fast performance quad core CPU is preferable.
2. 15mb of space on memory.
3. 1GB of RAM but for better and improved performance 1.5GB is preferable.

Software:

This section lists the requirements that are needed to run the system efficiently. Minimum 'Android Jelly Bean' operating system is needed for the application to run. The interface to run the application, the driver for running android APK applications, the integrated development environment to develop the application, and the third-party tool used for editing purposes are as follows:

a. Operating Environment:

Applicable Operating System	-	Version
Jelly Bean	-	4.1-4.3.1
Kitkat	-	4.4-4.4.4
Lollipop	-	5.0-5.1.1
Marshmallow	-	6.0-6.0.1
Nougat	-	7.0-7.1

- b. Web Brower: Internet Explorer (8.0 and above), Mozilla Firefox (3.0 and above), or Google Chrome these browser will need to login to Admin Panel of the Solvestar.
- c. Drivers: Java Runtime Environment.
- d. Third-Party Tool: Notepad++, Adobe Fireworks, www.creately.com and www.flaticon.com

Assumed implementation constraint can be:

- 1. System Failure
- Product Failure (Mobile Phone)
- Implementation Constraint in SRS
- The project may not meet the agreed quality parameters
- The project may cause any impact on other on-going processes.
- The project might not deliver on the agreed time

4.3 Data Design

The Internal Data Structures are the member variables of each class. The following are the internal data structures used in each of the classes:

User Table

- a. user_id: this is the unique identifier of each user
- b. name: the name of the user
- c. username: the username of the user
- d. password: password of the user

- e. gender: gender of the user
- f. dob: this is the date of the birth of the user
- g. email: the unique email of the user
- h. phone: the phone no of the user
- i. address: the address of the user

Post Table

- a. post_id: the post ID associated with that particular post
- b. user_id: the ID of the user who placed the post.
- c. post_category: the category of the post.
- d. post_description: full description of the post posted by the user
- e. post_comment_id: the ID of the comments commented by other users
- f. post_views: the total number of the views of the post
- g. post_time: the time when the post was posted.
- h. post_date: the date when the post was posted.

Message Table

- a. message_id: the unique id generated for each message sent by the users
- b. user_id: the unique id of the user
- c. message_description: description of the message send by the user.
- d. message_replies: replies of the message
- e. message_reply_id: the unique id generated by system for each reply
- f. message_time: sent time of the message

g.date: sent date of the message

User Post Table

- a. user_id: the unique id of the user
- b. post_id: the unique id of the post generated by the system
- c. boolean_solve: will keep a value if the problem has been solved or not
- d. no_of_answers: total no of answers given by the users
- e. answer_id: the unique id of the answers generated by the system
- f. answer_description: the descriptions of the answers

Notification Table

- a. notification_id: the unique id of the notification generated by the system
- b. notification_category: the category of the notification
- c. notification_time: time of the notification
- d. notification_date: date of the notification
- e. user_id: the unique id of the user

Report Table

- a. report_id: the unique id of the report generated by the system
- b. report_users: users that are reported
- c. report_description: description or reason of the report
- d. report_time: time of the report
- e. report_date: date of the report.

Profile Table

- a. profile_id: the unique id of the profile generated by the system
- b. user_id: the unique id of the user
- c. post_id: the unique id of the post generated by the system
- d. points: total collection of points collected by the user
- e. photo_path: the path where user photo is saved

4.3.1 Entity Relationship (ER) Diagram

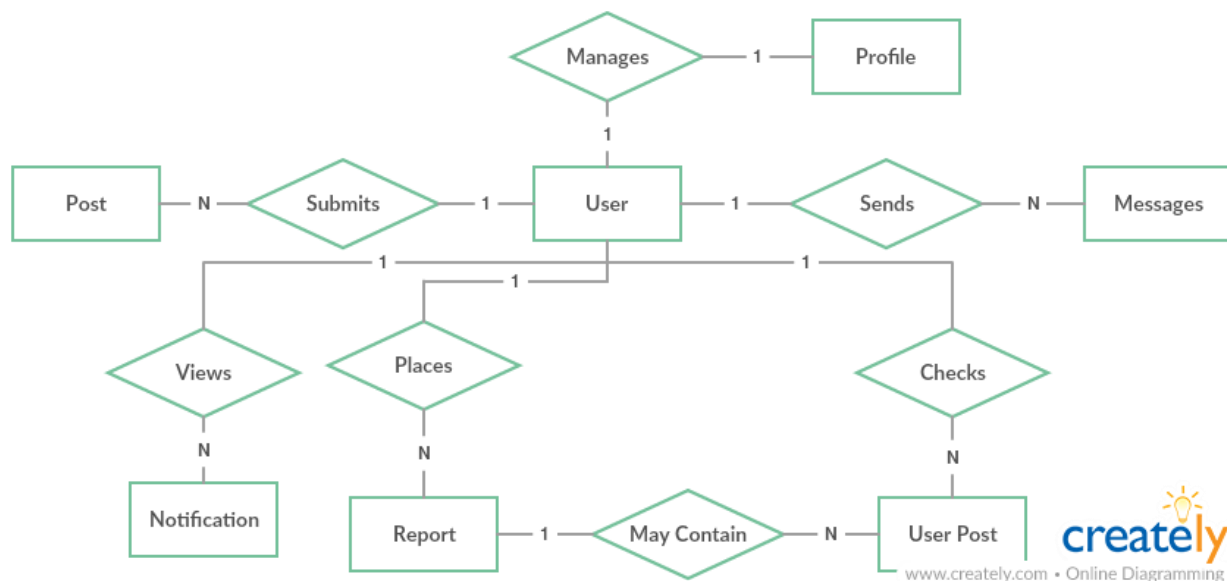


Figure 4.2: Entity Relationship Diagram for Solvestar Phone Application.

4.3.2 ER Diagram Attributes

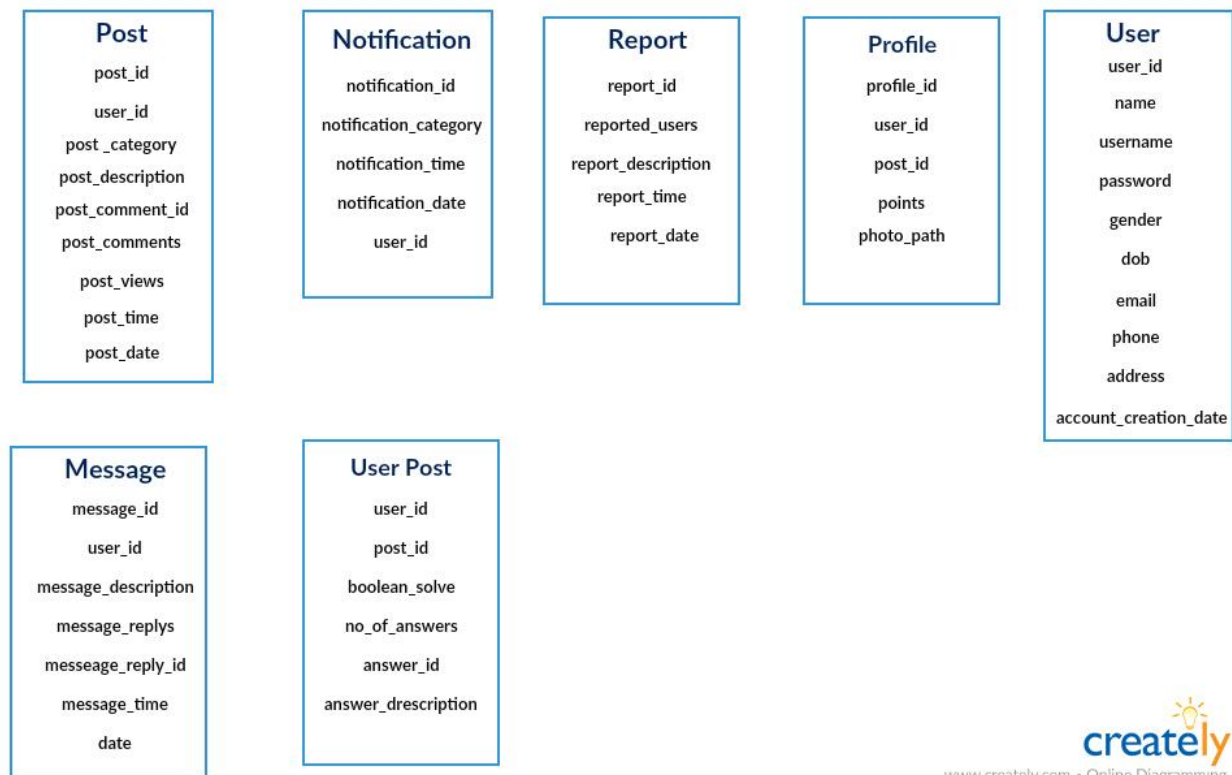


Figure 4.3: ER Diagram Attributes for Solvestar Phone Application.

4.4 Program Structure

4.4.1 Activity Diagram

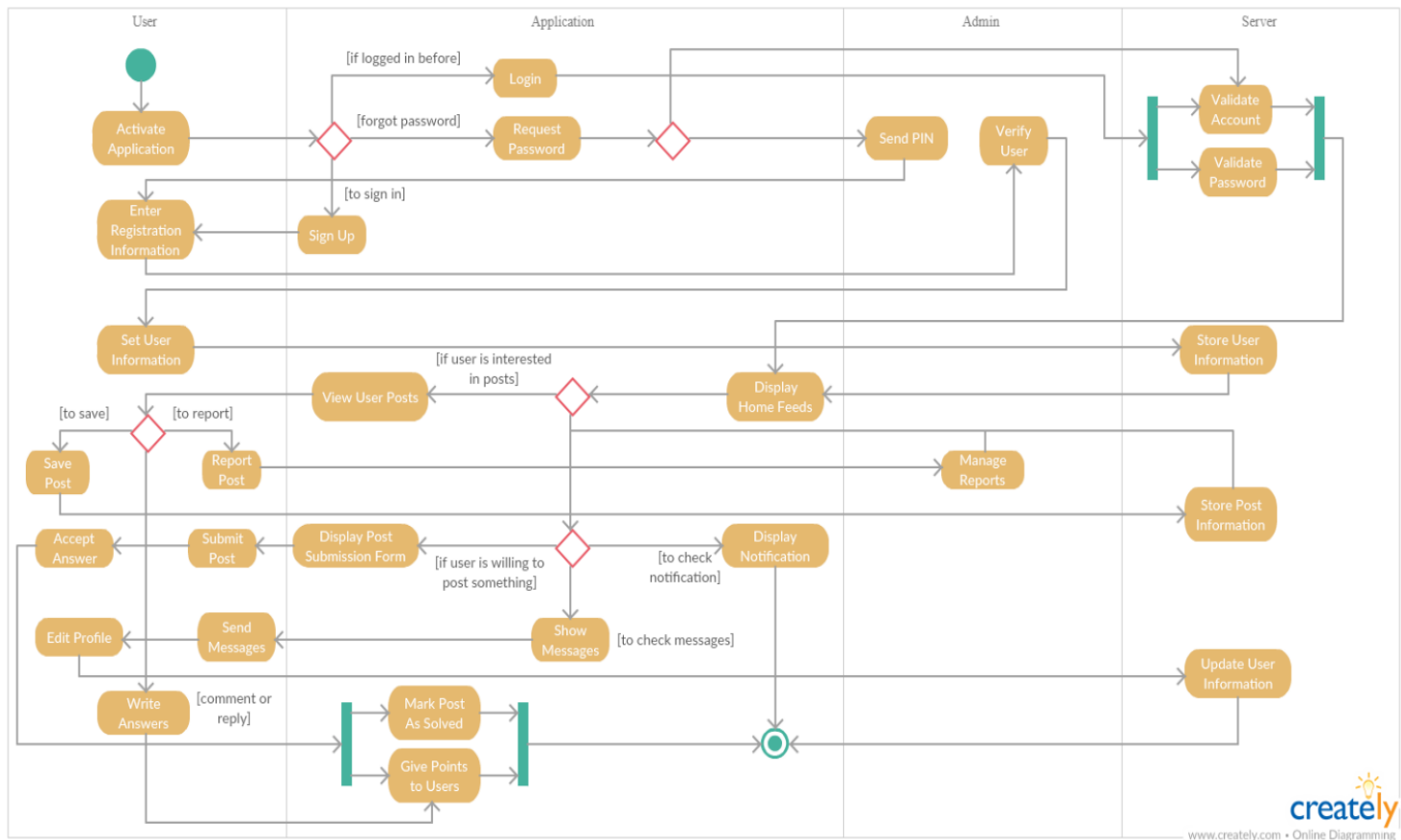


Figure 4.4: Activity Diagram for Solvestar Phone Application.

4.4.2 Class Diagram

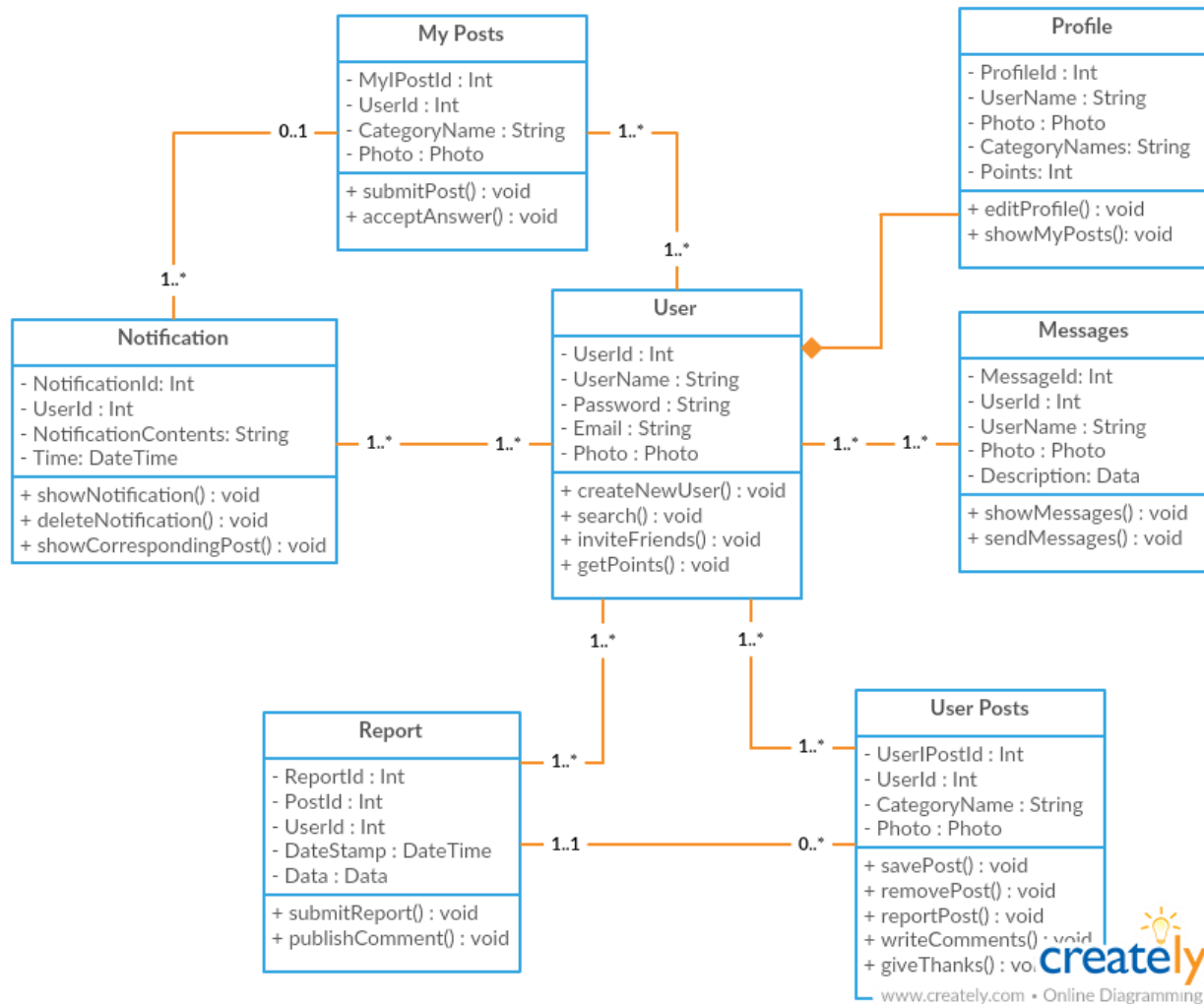


Figure 4.5: Class Diagram for Solvestar Phone Application.

1. User Class

The user class is used to store the details of all the users. It is used to create a new user or help an existing user login. There are two types of users: admin and a normal user. Every user can place an order or search for a product. The admin can add and delete products as well.

2. User Posts Class

The User Posts class contains the posts posted by the user .This class is also used for storing all answers of the post , total number the post and a bool value so that we can get info if the post got any answer or not.

3. Profile Class

The Profile class contains the details of the users in the application. This class will store the post id and user id and we will also be able to get the points and photo path from this class.

4. Message Class

The message class contains the details of the messages of a user posted on the various questions in various categories. This class is responsible for sending messages and sending replies to other users.

5. Notification Class

The notification class contains the various kind of notification for different kind of the Events. This class is used to help the user to get alerted with the application.

6. Report Class

The specifications class contains the information about complains and reports against a user. This class is responsible for any action done to any account .Account

may get permanently closed or warning if a minimum of report has been filed against a user.

7. Posts Class

The class contains the various information about a post place by the user. Every details of a post like of the products. This class is used keep record and store of every comments their date and timing etc.

4.5 User Interface Design

4.5.1 Interface Design Rules

Our design convention are not different form other related phone applications. We believe that familiarities and user friendliness makes a user happy. That is why most of the phone applications use the same design approach because users strongly expect standard elements to work in a certain way when they use a new application. So, keep in mind users perspective and vision over phone applications we followed all possible design rules and making it consistent to the users. Our design elements are common enough that users expect them to work in a certain way.

4.5.2 Detailed Description

In this short period of time we tried our best in development. We built most of the front end designs of every activities and pages of the application. In our perspective our design conventions are unique and perfect. All of the activities or pages front end designs are given below.

4.5.2.1 Login and Registration Page

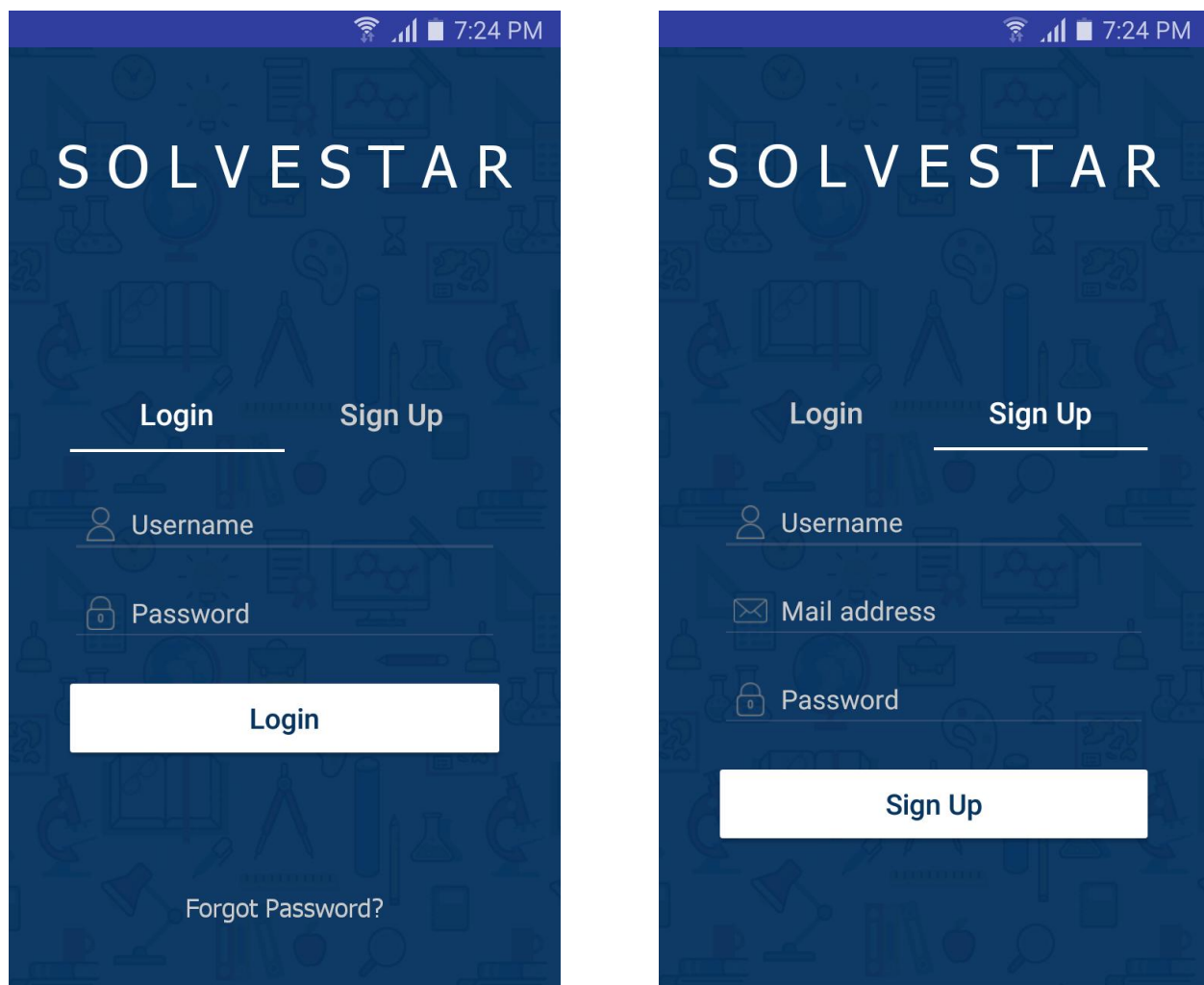
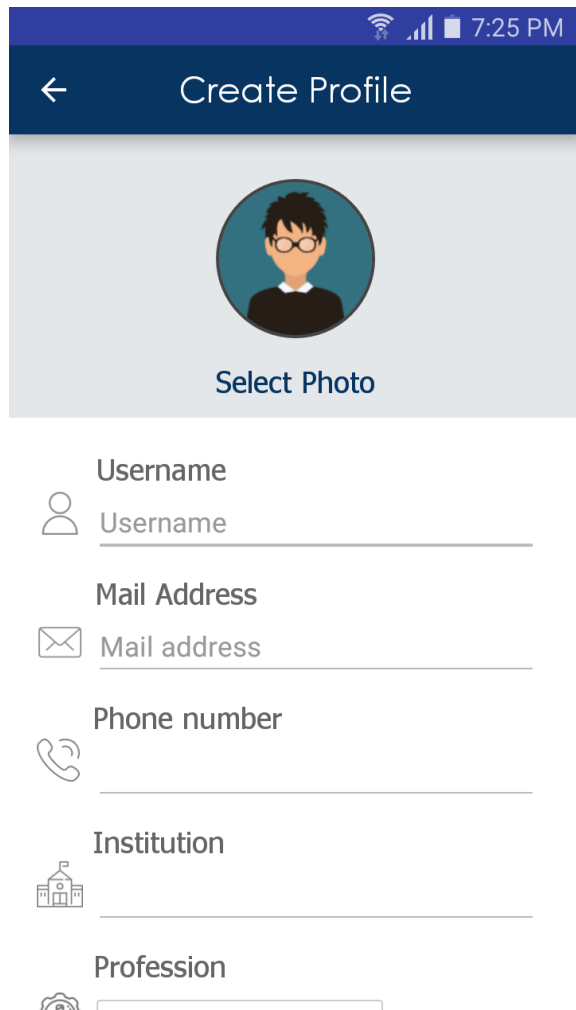


Figure 4.6: Login and Registration page of Solvestar application.

4.5.2.2 Create Profile Page



← Create Profile

Select Photo

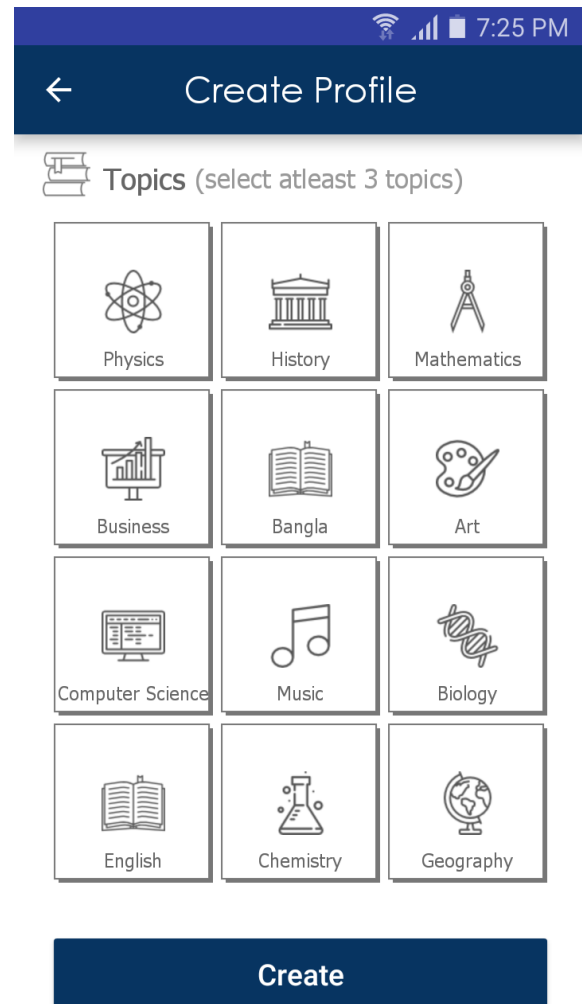
Username

Mail Address

Phone number

Institution

Profession



← Create Profile

Topics (select atleast 3 topics)

Physics	History	Mathematics
Business	Bangla	Art
Computer Science	Music	Biology
English	Chemistry	Geography

Create

Figure 4.7: Create Profile page of Solvestar application.

4.5.2.3 Home Feeds

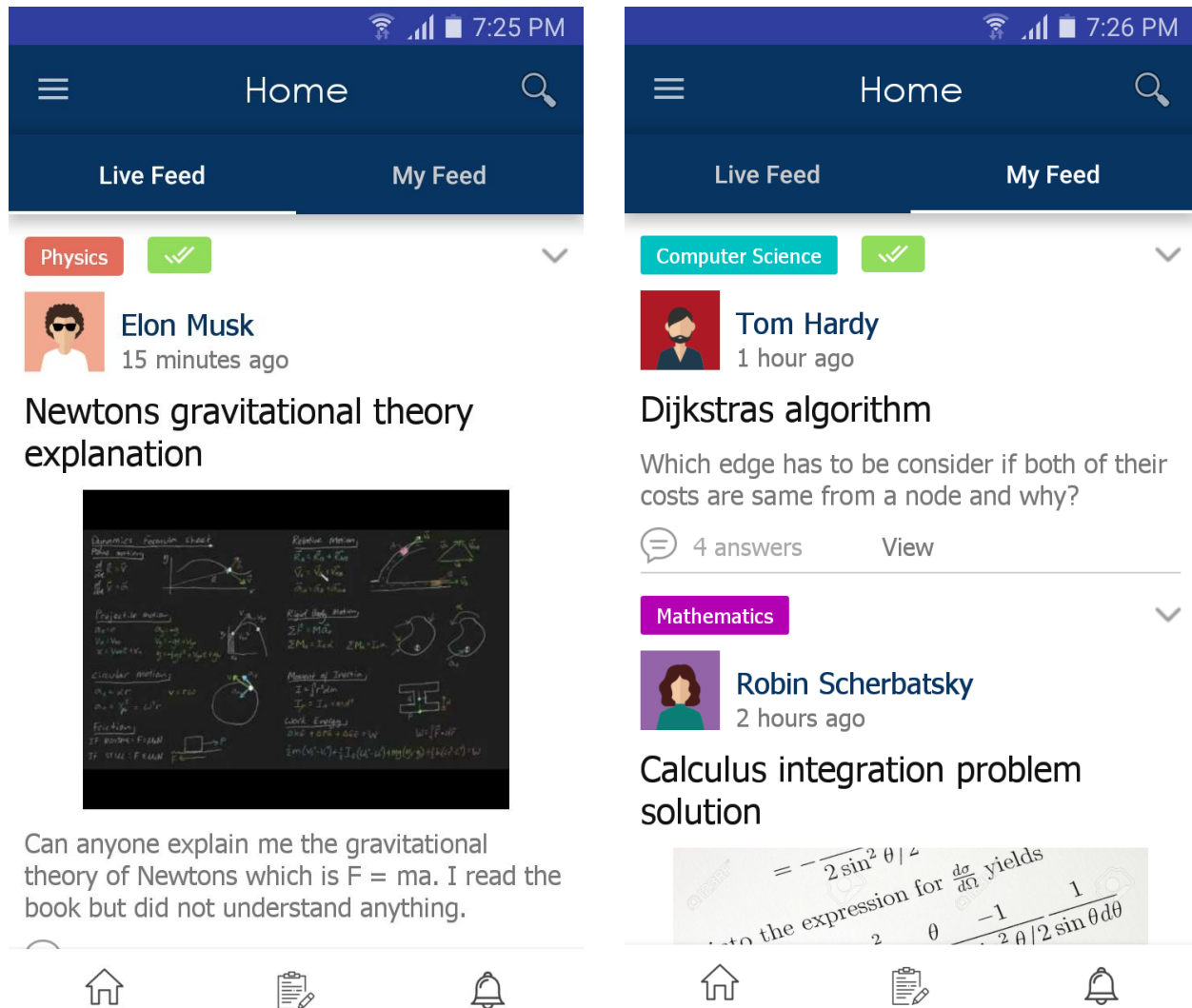


Figure 4.8: Home Feeds page of Solvestar application.

4.5.2.4 User Post Page

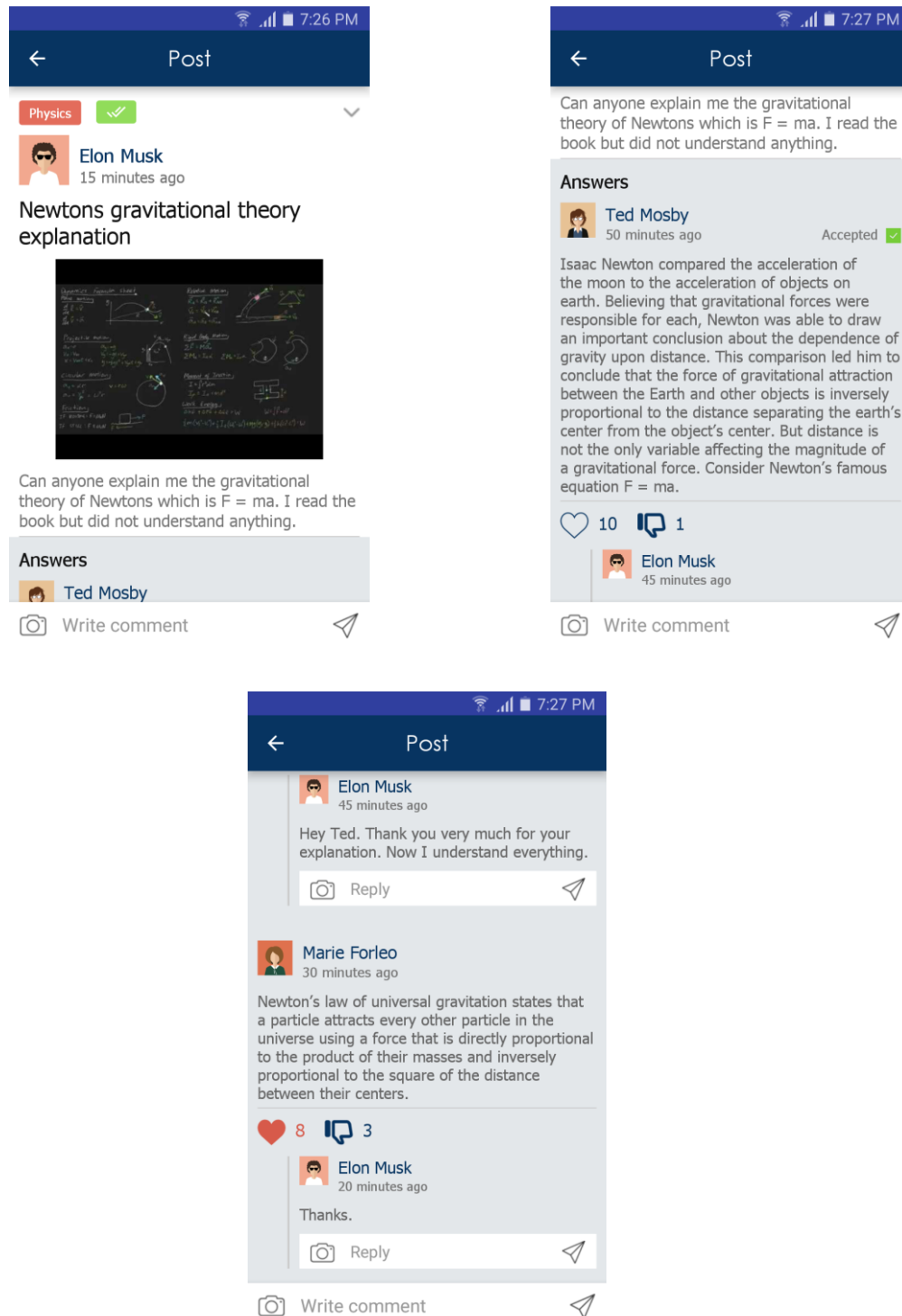


Figure 4.9: User Post page of Solvestar application.

4.5.2.5 Search Bar and My Post Page

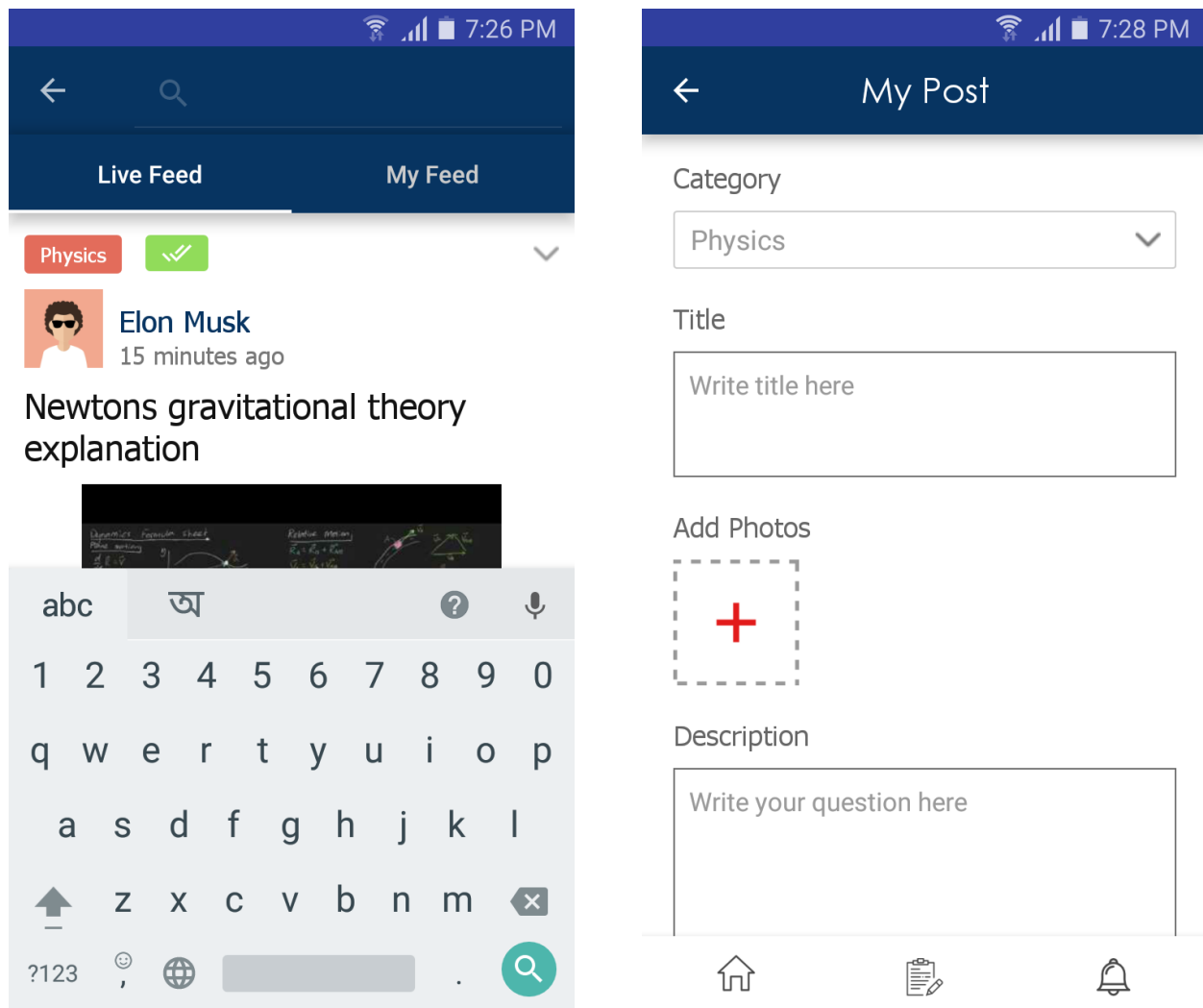


Figure 4.10: Search Bar and My Post page of Solvestar application.

4.5.2.6 Notification and Side Bar (Navigation Drawer) Page

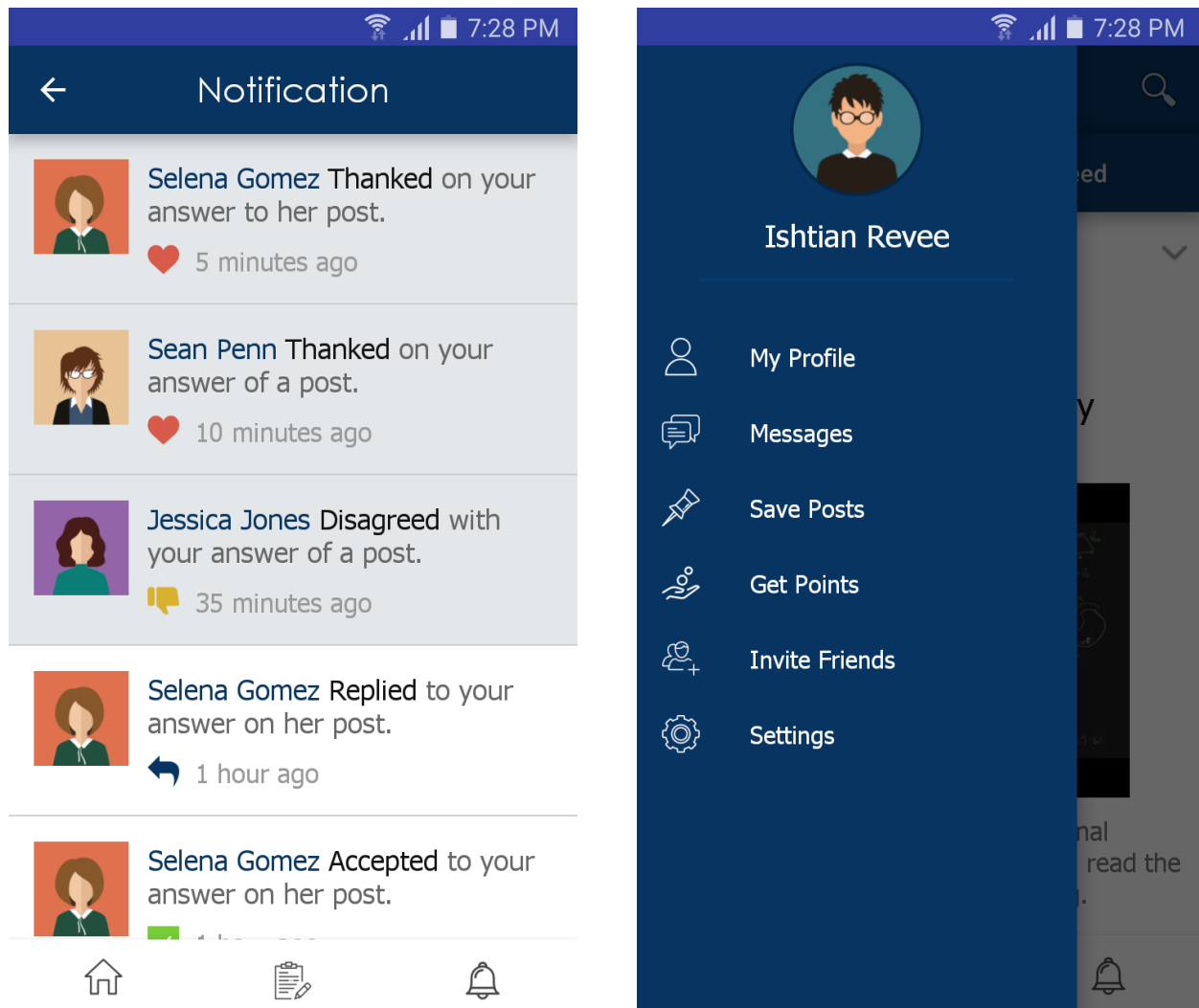


Figure 4.11: Notification and Side Bar (Navigation Drawer) page of Solvestar application.

4.5.2.7 My Profile Page

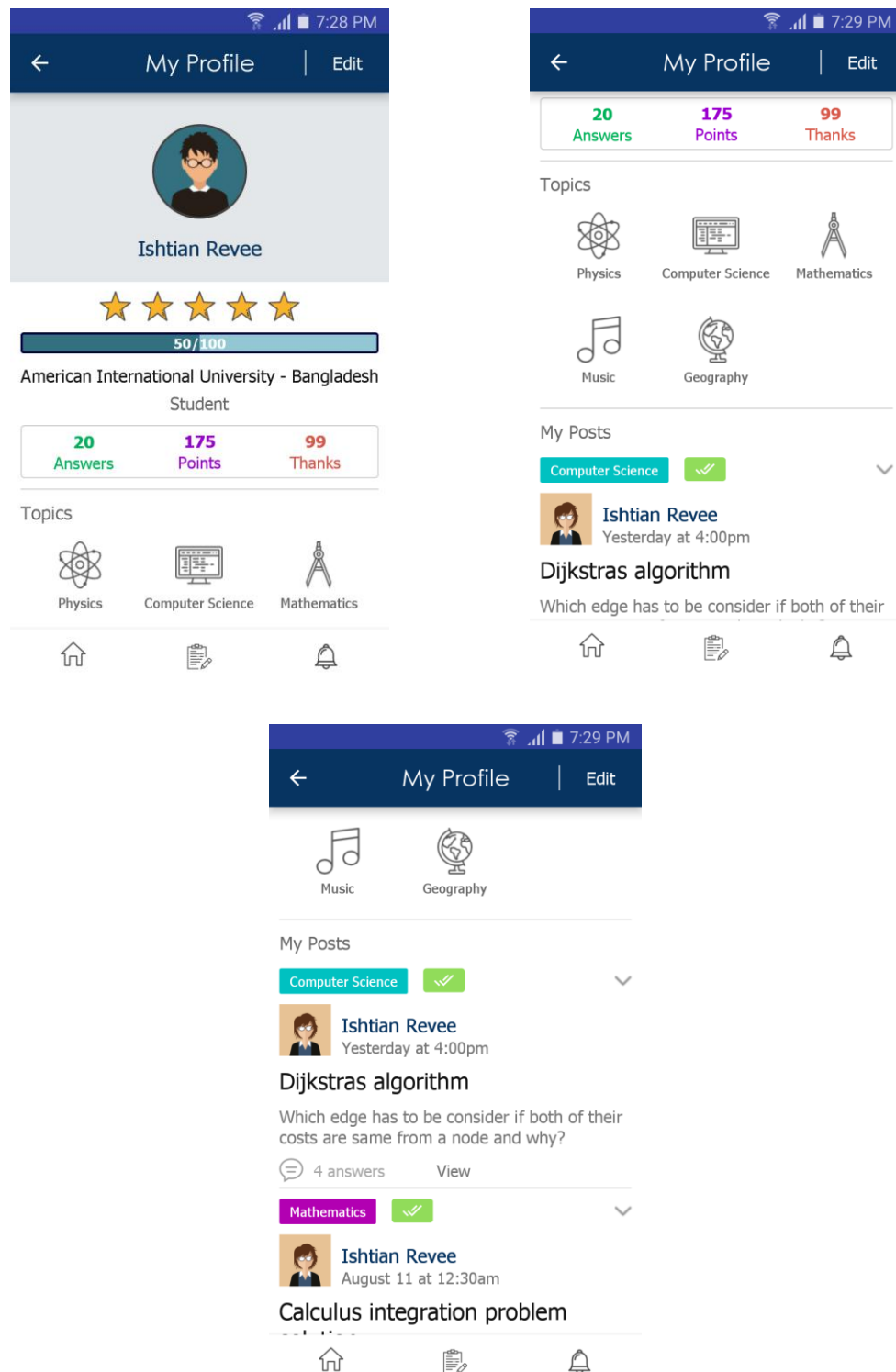


Figure 4.12: My Profile page of Solvestar application.

4.5.2.8 Edit Profile Page

The image displays two screenshots of the 'Edit Profile' page in the Solvestar application. Both screenshots show a dark blue header with a back arrow, the title 'Edit Profile', and a 'Save' button. The status bar at the top indicates the time is 7:29 PM.

Left Screenshot: The page features a circular profile picture of a person with glasses and a dark shirt. Below the photo is a button labeled 'Edit Photo'. The form includes the following fields:

- Username:** A text input field with a person icon on the left.
- Mail Address:** A text input field with an envelope icon on the left.
- Phone number:** A text input field with a telephone handset icon on the left.
- Institution:** A text input field with a school building icon on the left.
- Profession:** A text input field with a graduation cap icon on the left.

Right Screenshot: This screenshot shows the 'Topics' section, which requires selecting at least 3 topics. The topics are displayed in a 4x3 grid of boxes, each containing an icon and a label:

Physics	History	Mathematics
Business	Bangla	Art
Computer Science	Music	Biology
English	Chemistry	Geography

Figure 4.13: Edit Profile page of Solvestar application.

CHAPTER 5

FUTURE DEVELOPMENT

5.1 Future Development

In the current version of the system we are planning to develop the basic functionalities that we had proposed for this project. But still it lacks some of the cool features that user would like.

We have some great future plan on this project as we have a clear vision of how this project could be a great success. Some of the points we would like to mention for our future plan. The following points could be implemented in later versions:

1. Plugins: Initially we are implementing basic registration and login system where users have to set their sign up information and have to agree all the terms and conditions of the system to be a member of this service. But in future we would like to simplify the registration system. Therefore, we would like to implement registration plugins with Facebook and Google+.
2. Friends Invitation: As we are planning for a plugin registration system in this app so we can do one more cool stuff of friend invitations form Facebook as well as google+. Again this is a great source for marketing of this service system.
3. Business: We already mentioned the point system which will be integrated in this application, and for the future we are planning of some business tricks with this point system. Such as users can use the points that the users collects from the app

for some awards. We haven't thought about that yet. But we would like to implement some mechanism for business purpose.

4. Best Performances: Best performance recognition among the members would be a great source for user affairs. Users will take this service seriously to get awarded weekly or monthly and will give their best performances. And what we would like to do is that we will monitor user activities and make a leaderboard for the top users and awarded accordingly.

5. Micro Learning Courses: We plan for a premium version of this system and in that version we had plan for micro learning courses for some specific topics. We also planned for online tutorials but did not analyzed it in details yet.

CHAPTER 6

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