A Major Project Final Report on

INFOSHARE: A KNOWLEDGE SHARING WEBSITE

Submitted in Partial Fulfillment of the Requirements for

the Degree of **Bachelor of Engineering in Information Technology**

under Pokhara University

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ABSTRACT

InfoShare is an online knowledge sharing web application that is developed to provide students and professors a platform to gain and share knowledge. InfoShare allows students and professors to register an account in the initial stage. They can login and post any questions, queries or confusions. These questions are put on display on the site. Other students and professors who have any knowledge regarding that question can then post the answers. Previously asked questions are also displayed on the site for other students and users. The ultimate goal of our project is to provide a communication interface between the students and teachers. The web application will consist of features such as notification system for the students when their posted question is answered, search engine for searching their required solutions, home page for the activities that go on in the website, voting or liking system for the answers that are appropriate.

Keywords: InfoShare, Knowledge, Questions, Answers, Students, Professors.

ACKNOWLEDGEMENT

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Also, we would like to give our gratitude and appreciation to our head of department **Mr. Madan Kadariya** sir and our college principal **Mr. Niranjan Khakurel** sir for giving us this chance to make and complete our second minor project.

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LIST OF ABBREVIATIONS

PHP Hypertext Preprocessor

CSS Cascading Style Sheets

HTML Hyper Text Markup Language

JSON JavaScript Object Notation

DFD Data Flow Diagram

ER Entity Relationship

SQL Structured Query Language

SRS System Requirement Specification

TABLE OF CONTENTS

1. INTRODUCTION

The system provides a platform for knowledge sharing. InfoShare is a web application for gaining and sharing knowledge especially for the students and professors of our college.

This website gives students a platform for posting questions, queries and confusions regarding any subjects or any topics. Every student faces a situation especially during exams when they are not able to understand or not able to find answers to a certain topic of a certain subject anywhere. Contacting and asking peers, friends, seniors or professors is very time consuming. They can explore the site and search for the answers to their questions. If the question has not been asked by anyone yet, they can simply post a question and anyone who has the information can simply post the answer.

Students and Professors can sign up on the site to be a member and are given the freedom to ask questions about any topic and also answer and share their own knowledge. The questions are displayed on the site for other students to gain knowledge and information from. The website helps students to learn from each other and develop a good learning environment in college.

1.1 PROBLEM STATEMENT

It is obvious that engineering subjects are tough. All the answers to each and every topic cannot be found in notes or books or any study materials given by the professors. There is limited time for studying during exams and searching answers throughout the internet or any other study material is time consuming. So, often every student panic at some point during the exam preparation. This can also be a prime reason for the students for not gaining a better grade or even failing the subject that they get panicked upon.

The language in the books and notes of certain subjects can be very complex and hard to understand. Asking friends, seniors or professors personally is also not a viable solution. It can lead to poor performance in the exams and can affect the student's confidence. Students don't have the time to come back and forth to college in order to meet the teachers.

1.2 OBJECTIVES

- To develop a website that allows students to post their questions, confusions and queries about any topic.
- To provide a platform for communication among students and professors.
- To implement a notification system that notifies students when their questions are addressed.
- To implement a voting system and a reporting that allows the users to vote according to their preference.
- To implement a search bar that allows the users for searching their required solutions.
- To implement a recommendation system for the users to answer questions.

1.3 SIGNIFICANCE AND LIMITATIONS

InfoShare is aimed to effectively change the learning and sharing environment in the college. Its significance can be listed as follows:

- Students can explore the website and gain knowledge and information.
- They can ask and post any questions they have on any topics.
- Professors and seniors can contribute by helping the students and answering the questions in a simple and easily understandable language.
- Students can gain access to contact information of the professors so that they can contact them personally.
- InfoShare can provide a better communicating, learning and sharing environment among students and also among students and professors.
- Students can vote a certain answer if it is correct and helpful. It helps other students to gain access to the viable and correct answer easily.

However, it has some limitations as listed below:

- There is no method for knowing whether the answers posted are correct or not.
- Students would have to wait a certain time for getting their answers if any teachers or seniors are currently unavailable.

2. LITERATURE REVIEW

In this section, similar knowledge sharing and question-answer websites are reviewed. There are many websites which have the main feature of asking and answering questions and some of them are discussed below:

2.1 EXISTING SYSTEMS

- **Quora**
  Quora as mentioned in [1] is one of the most well-known question-and-answer websites on the Internet. It is a place to gain and share knowledge. It is a platform to ask questions and connect with people who contribute unique insights and quality answers. It is free to use, and is somewhat more professionally-moderated. We can find questions and answers similar to the ones that we are looking for, or if we can't find them, we can ask a unique question ourselves. We can also answer questions posed by others. We can also add to questions and answers, or debate which answer is the most correct.

- **Yahoo Answers**

  Yahoo Answers as mentioned in [2] is also a knowledge sharing website. It's also free to sign up for, and includes a sort of "game" system where we gain points for answering other people's questions. This increases the number of questions that we can ask or answer per day. It has been noted that Yahoo Answers isn't quite as professional or heavily-moderated. Certain questions may be poorly formed or trivial, and answers may not be necessarily correct. There is often a limited amount of time to answer a question.

- **Stack Overflow**
  As mentioned in [6] Stack Overflow is the largest, most trusted online community for anyone that codes to learn, share their knowledge, and build their careers. More than 50 million unique visitors come to Stack Overflow each month to help solve coding problems, develop new skills, and find job opportunities.

- **Stack Exchange**
  Stack Exchange is a great community similar to Quora that lets you get answers and provide responses to questions online. The more you interact on Stack Exchange, the more reputation you will build and the more your answers will be trusted. Stack Exchange is an

incredibly popular Q&A social site, making it simple to get answers for a vast amount of different categories.

- **Reddit**
  It is an American discussion website. Registered members submit content to the site such as links, text posts, and images, which are then voted up or down by other members. Posts are organized by subject into user-created boards called "subreddits", which cover a variety of topics including news, science, movies, video games, music, books, fitness, food, and image-sharing as mentioned in [7].

2.2. COMPARISION WITH EXISTING SYSTEMS

There are many different and discrete applications and systems are used to provide different functionalities and feature for questioning and answering. But all these web applications are for the general public. Anyone can ask anything in these websites. All these websites are very vast. A knowledge sharing website that is mainly targeted for communication between students and teachers have not been developed.

2.3 PROPOSED SYSTEM

The completed project InfoShare is able to provide users with following services:

- The system acts as a platform for students and teachers for communicating with each other.
- Students can post questions and queries about any subject and any topic on the site.
- Professors and students can post answers to the questions to which they are well known about.
- Students are categorized according to their faculty and semester. So that the answers that are related to their syllabus will be displayed in their feed.
- Users are also categorized according to their knowledge areas and subjects that they teach so that only the questions which they can correctly address are recommended to them.
- Other users can also vote the answers that they find appropriate.
- The website provides a search bar to make it easier for the students to find solutions for their questions and queries.
- The students are notified once their posted queries have been addressed.
- Previously answered questions are displayed on the site for other users and students.

3. METHODOLOGY

We have planned to work following these methodologies for the application of knowledge, skills and technique to broad range of activities in order to meet the requirement of our project.

3.1. SOFTWARE DEVELOPMENT LIFECYCLE

The framework we used for developing this project is incremental model of software development life cycle. As mentioned in [3] the system is put into production when the first increment is delivered. The first increment is a core product where the basic requirements are addressed, and supplementary features are added in the next increments until the software requirements are fulfilled and the software is ready to deploy. Figure 1 shows the basic diagram of incremental model.

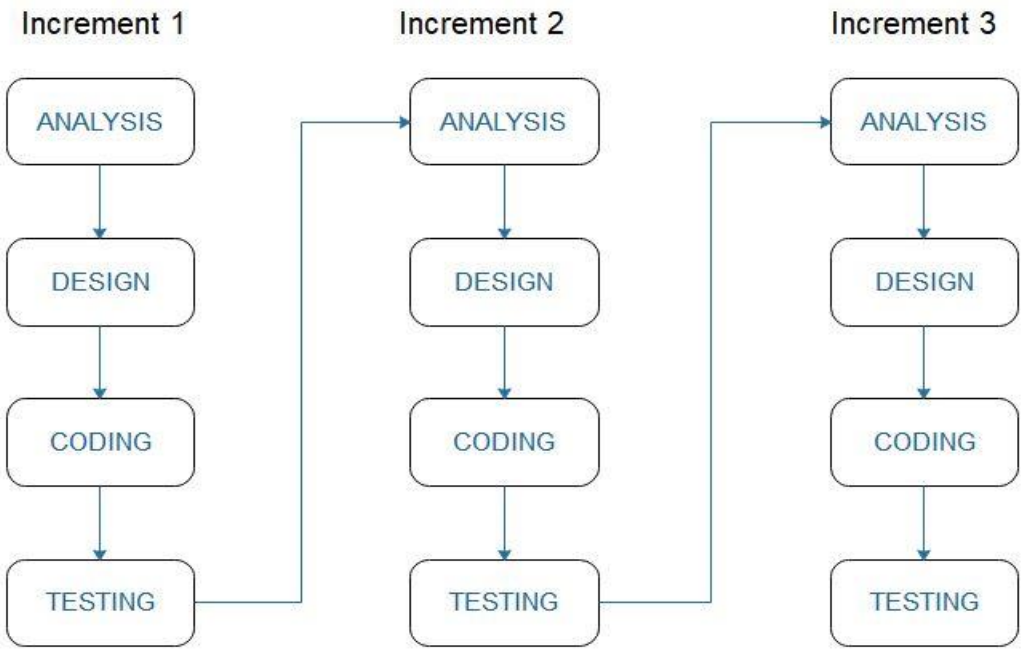

Figure 1: Incremental model of software development life cycle

3.1.1. REQUIREMENT ANALYSIS:

The goal of systems analysis is to determine where the problems is an attempt to fix the system. This step involves breaking down the system in different pieces and drawing to analyze the situation, analyzing project goal, breaking need to be created and attempting to engage users so that definite requirements can be defined.

3.1.2. DESIGN PHASE:

In this phase the SRS would be translated into the system design. Context diagram DFD ED diagram, use case diagram, sequence diagram and class diagram will be developed. The output of this stage will describe the system as a collection of modules or subsystems.

3.1.3. CODING PHASE:

In this phase coding will be done according for the design and a working system will be developed by the end of the process. Modular and subsystem programming code will be accomplished.

3.1.4. TESTING PHASE:

In this phase the system will be tested with each testing list of changes to the system developed, is suggested and the change will be applied to the software and the software would be delivered as a successive increment until a satisfying system is achieved.

3.2. WHY INCREMENTAL MODEL?

As we are not able to figure out all the requirements and the correct strategies to generate the desired outcome on the very first attempt, because these requisites may change as the development phase goes on. So incremental model is appropriate for the project.

3.3. ADVANTAGES OF INCREMENTAL MODEL

- Generates working software quickly and early during the software life cycle.[4]
- More flexible – less costly to change scope and requirements.
- Easier to test and debug during a smaller iteration.
- Easier to manage risk because risky pieces are identified and handled during its iteration.
- During iteration process it will be easy to handle functionality.

3.4. TOOLS AND TECHNOLOGIES USED

3.4.1 TECHNOLOGIES

- For front end
  - HTML and CSS - To develop interactive user interfaces.
  - JavaScript- For event handlers and behaviors to add user interaction.
  - Bootstrap- A CSS framework for further styling the application.

- For back end
  - PHP- For server - side validation.
  - LARAVEL - PHP Framework.

- For database management system: MySql.

3.4.2 TOOLS

- JetBrains PhpStorm - IDE for web development
- E-draw - For designing.
- Adobe Photo shop - For designing UI/UX.
- Xampp - Local Server.

3.5. MVC FRAMEWORK

As mentioned in [5], MVC stands for "Model-View-Controller." MVC is an application design model comprised of three interconnected parts. They include the model (data), the view (user interface), and the controller (processes that handle input).
The MVC model or "pattern" is commonly used for developing modern user interfaces. It is provides the fundamental pieces for designing a programs for desktop or mobile, as well as web applications. It works well with object oriented programming, since the different models, views, and controllers can be treated as objects and reused within an application.

1. **Model**:
   Represents the data of the application. This matches up with the type of data a web application is dealing with, such as a user, video, picture or comment. Changes made to the model notify any subscribed parties within the application. The model is responsible for getting data from a database, packaging it in data objects that can be understood by other components, and delivering those objects — most of which will happen in response to input from the controller.

2. **View**:
   The user interface of the application. Most frameworks treat views as a thin adapter that sits just on top of the DOM. The view observes a model and updates itself should it change in any way. Different views can present information in different ways — an obvious implementation of multiple views would be to handle the display of information on a mobile or desktop browser.

3. **Controller:**
   Used to handle any form of input such as clicks or browser events. It's the controller's job to update the model when necessary (i.e. if a user changes their name). The controller is how the user interacts with the application. Usually, the controller takes user requests from the interface (often in the form of HTTP requests for web applications) and calls the model, which retrieves and processes the data, before returning it to the controller. The controller will then use the appropriate view to display those results to the user.

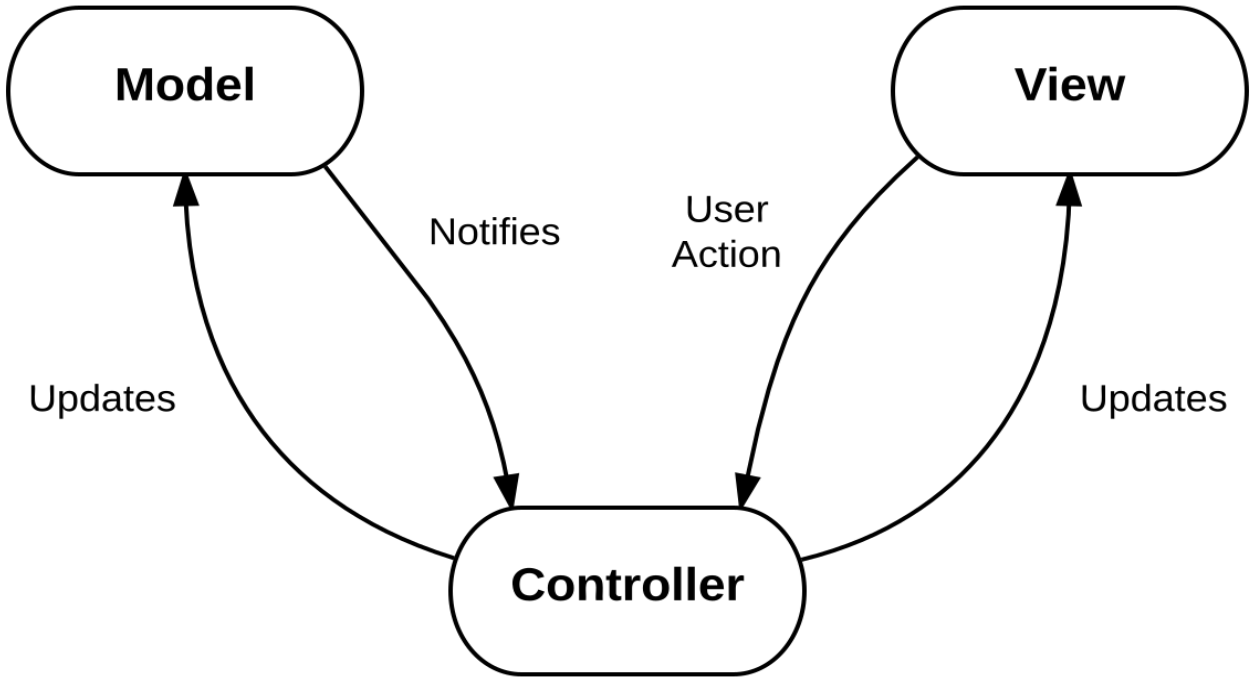

Figure 2: Model View Controller

3.6. WORK DIVISION

S.N.	ROLE	NAME	KEY ACTIVITIES
1.	Developer	• Alka Shilpakar	• Layout creation • Front end development • Back end development • Database Management • Presentation
2.	Project Manager	• Bishu Kafle	• Project planning • Design system interface • Documentation • Testing working of website • User experience check • Feasibility of website

Table1. Work division

3.7 MANAGING INCREMENTS

The project which implements the Incremental Model, comprises of three increments. The first increment was used for requirement analysis and evaluation. This process resulted in creation of a plan for the next increment. The iteration process, which includes the delivery of the increments to the user, continues until the software is completely developed, i.e. iteratively enhance the requirements until the final software is implemented.

The increments are discussed below:

- **Increment 1**

  In the first increment, core requirement analysis was done. We designed the skeleton of the project. This helped us to figure out every aspects of the project and take them into consideration. The artifacts produced in this phase are:

  - System Modules
  - Initial System Architecture
  - Feasibility Study
  - Use cases and Use case diagram
  - Domain model
  - ER Diagram
  - Data Flow Diagram
  - Activity Diagram
  - Sequence Diagram
  - Cost Estimation

  We worked on the design and development of the system interface. At the end of this increment, the system had the following functions:

  - Template of the application
  - User registration
  - User login
  - Record the data
  - Access the data
  - Validation
  - Questions posting

- **Increment 2**

  In the second increment, we worked on validating the system architecture with our back end. We analyzed further features that we can include in the system. At the end of this increment, the system had the following functions:

  - Answering system
  - Voting system for answers
  - Search bar
  - User profile
  - Notification system
  - Recommendation system

- **Increment 3**

  In this phase, we worked on fixing bugs and errors and began testing the system. We also made few changes to our system architecture as per the need. Overall validation of the system was done. We tested all the functionality of the system.

  - Overall system testing
  - Removing bugs and errors

4. SYSTEM DESIGN AND MODELS

UML is short for Unified Modeling Language. It is a standardized modeling language consisting of an integrated set of diagrams, developed to help system and software developers for specifying, visualizing, constructing, and documenting the artifacts of software systems, as well as for business modeling and other non-software systems. The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems. Using the UML helps project teams communicate, explore potential designs, and validate the architectural design of the software as stated in [8].

4.1 USE CASE DIAGRAM

The user registers a new account for the website or logs in if they already have an account. They can manage or edit their profile. Users can post any queries or questions that they have. Questions are displayed on the site and students and teachers can answer them if they have the knowledge. Users can upvote the answers that they find appropriate or right. Users can also search for the queries to find solutions .Figure 3 shows the use case diagram for our system.

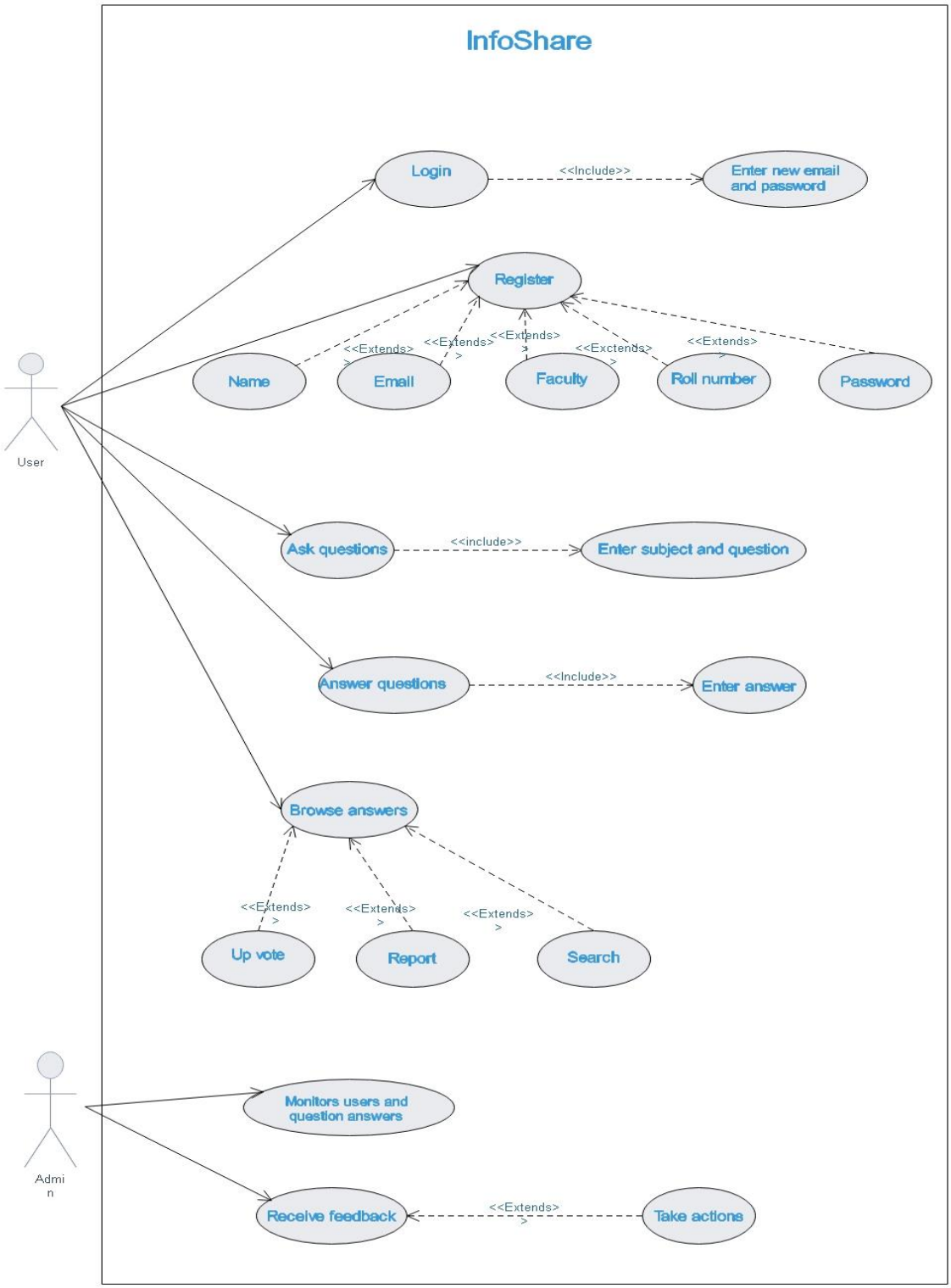

Figure 3: Use case diagram

4.2 DOMAIN MODEL

Domain model describes concepts in problem domain and is important to represent meaningful concepts that is understandable by everyone. It reduces gap between software representation and mental model perceived by analyst.

The domain model for this project is illustrated as below:

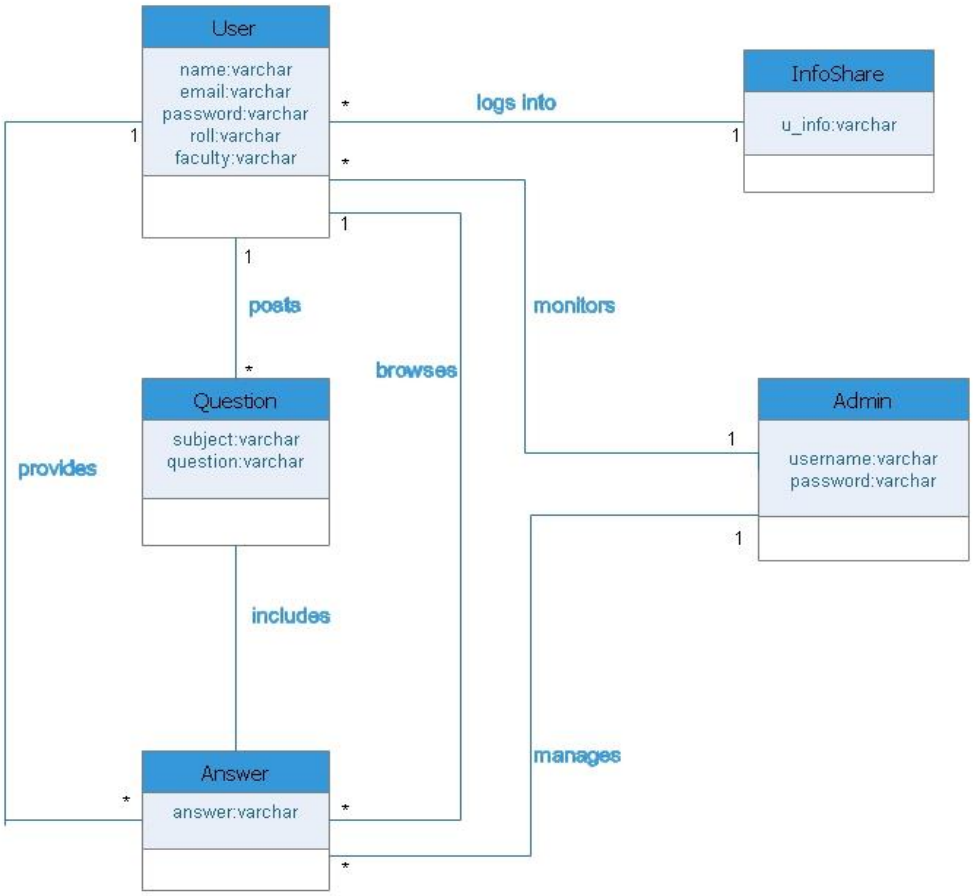

Figure 4: Domain model

4.3 E-R DIAGRAM

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties. For our project, it is illustrated as follows:

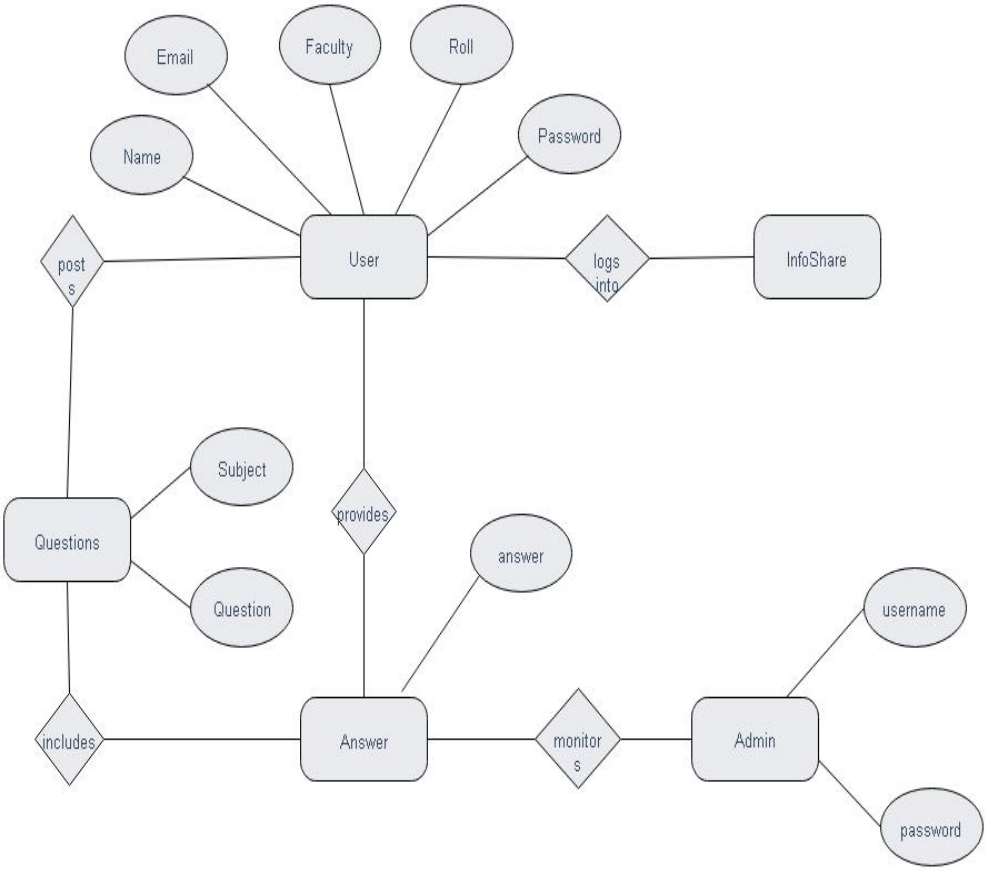

Figure 5: E-R Diagram

4.4 ACTIVITY DIAGRAM

Activity diagram represents the sequential flow of actions visually. Activity diagram shows the work flow from a starting point to end point. It represents flow activities.

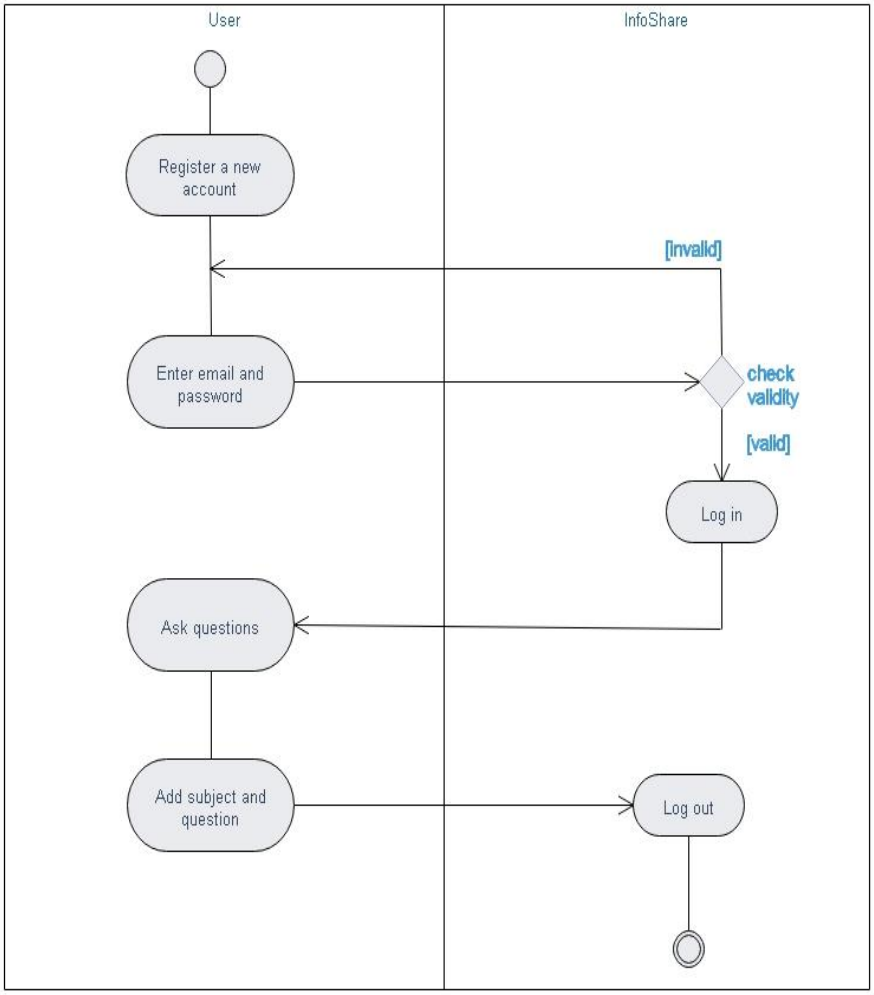

Figure 6: Activity diagram for registration, login and posting questions

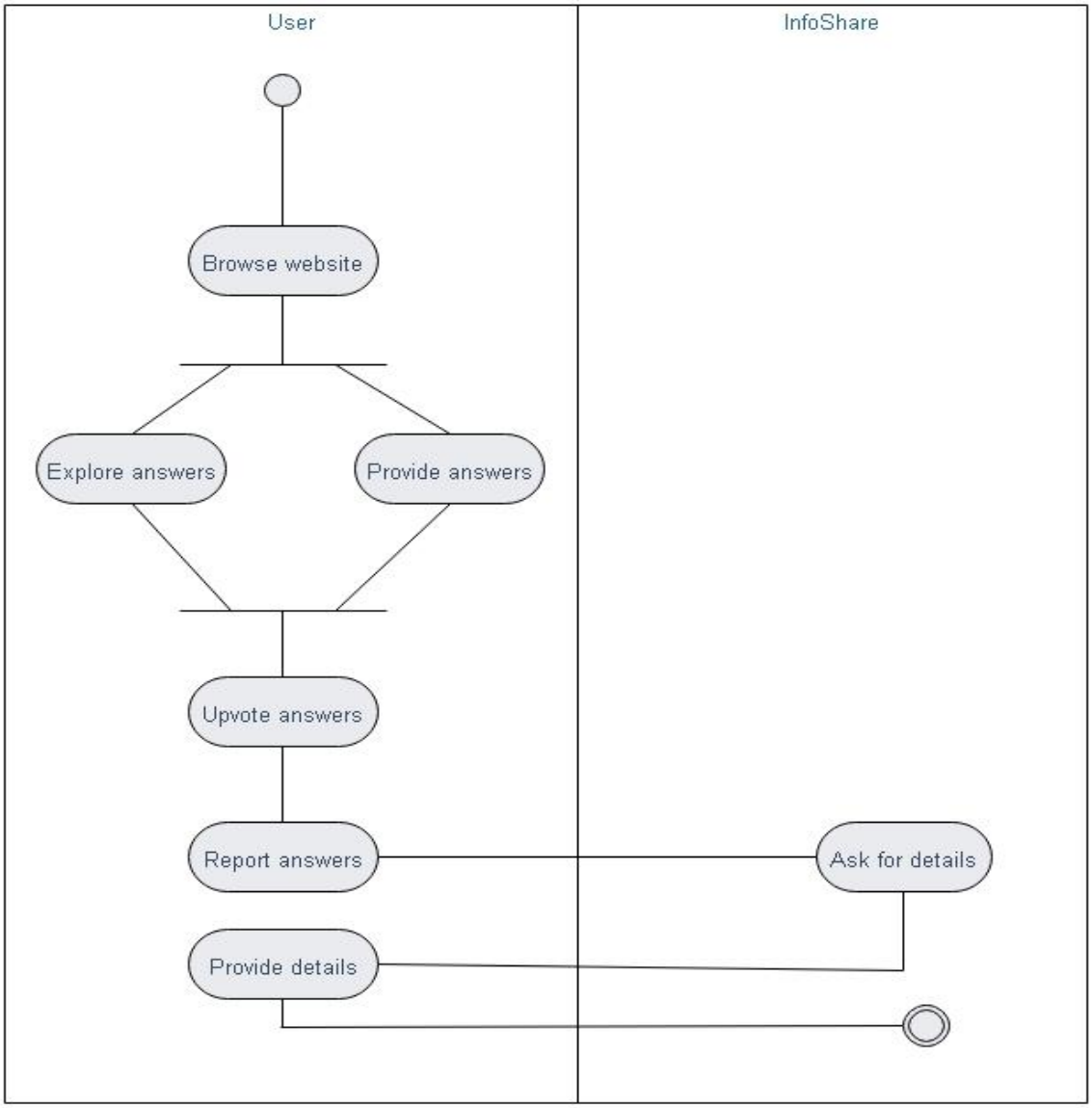

Figure 7: Activity diagram for browsing and answering

4.5 DATA FLOW DIAGRAM

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modelling its process aspects. We used DFD as a preliminary step to create an overview of the system, which can later be elaborated also be used for the visualization of data processing (structured design).

4.5.1 DATAFLOW DIAGRAM FOR USER REGISTRATION

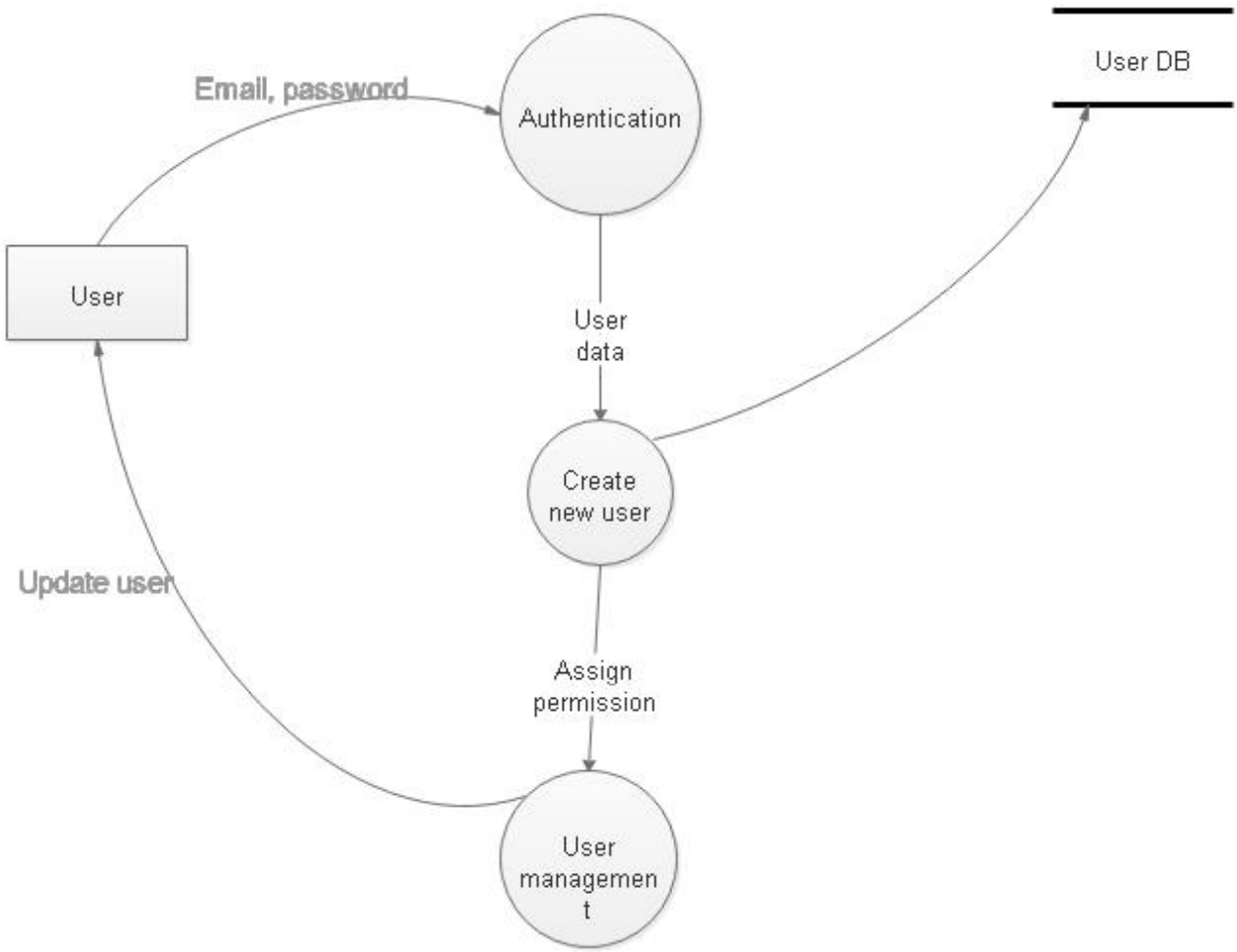

Figure 8: Dataflow diagram for user registration

4.5.2 DATAFLOW DIAGRAM FOR POSTING QUESTIONS

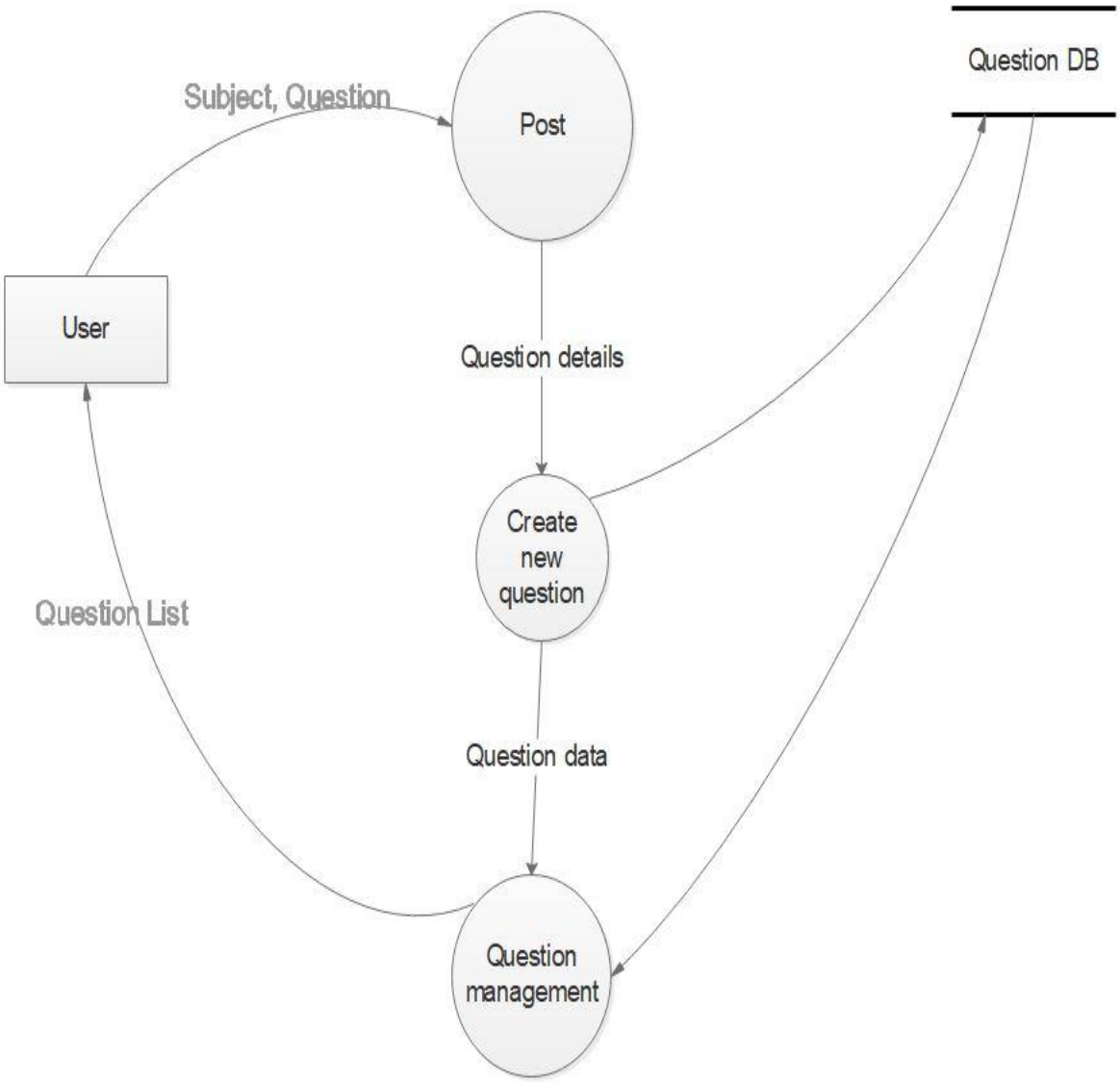

Figure 9: Dataflow diagram for posting questions

4.5.3 DATAFLOW DIAGRAM FOR POSTING ANSWERS

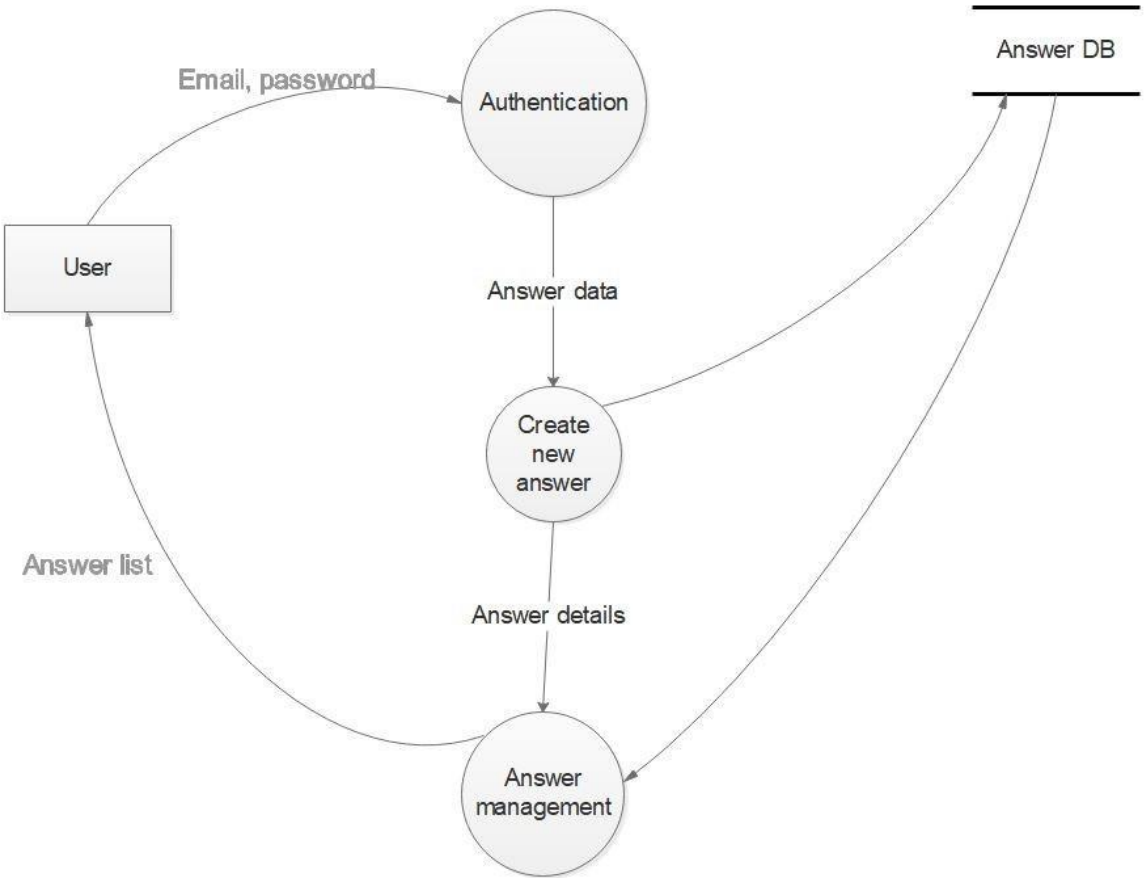

Figure 10: Dataflow diagram for creating answers

4.6 SEQUENCE DIAGRAM

Sequence diagram is an interaction diagram that describes interactions among classes in terms of an exchange of messages over time.

4.6.1 SEQUENCE DIAGRAM FOR REGISTRATION AND LOGIN

The diagram below describes the interactions a user has with the system registering a new account and logging into the account. The user provides details requested by the system which in turn, is stored in the system database. This data is used to confirm the validity of the user when he/she tries to log in.

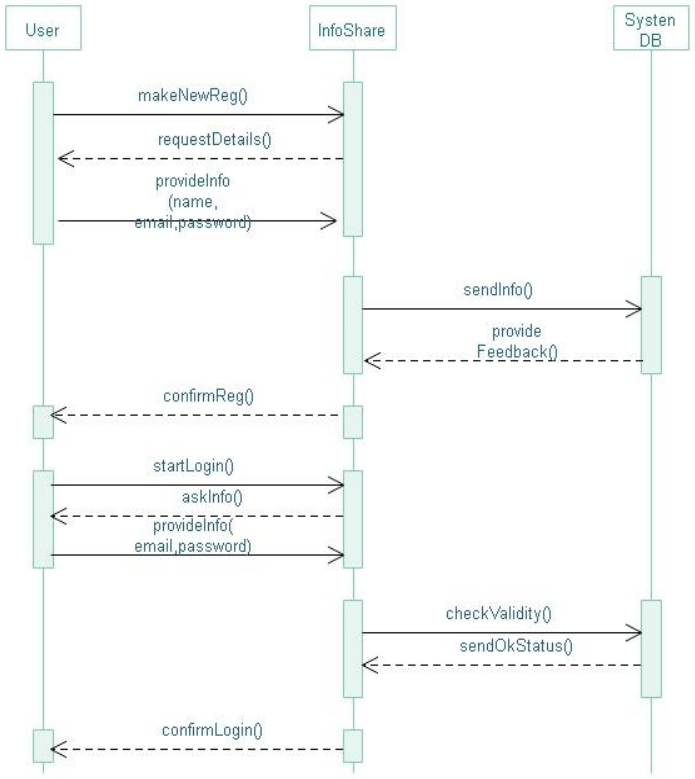

Figure 11: Sequence diagram for registration and login

4.6.2 SEQUENCE DIAGRAM FOR POSTING QUESTIONS

The diagram below describes the interaction a user has with the system while posting a new question. The user makes a new post action and is asked by the system to add subject and question of the posted question. These details are stored in the system database as well.

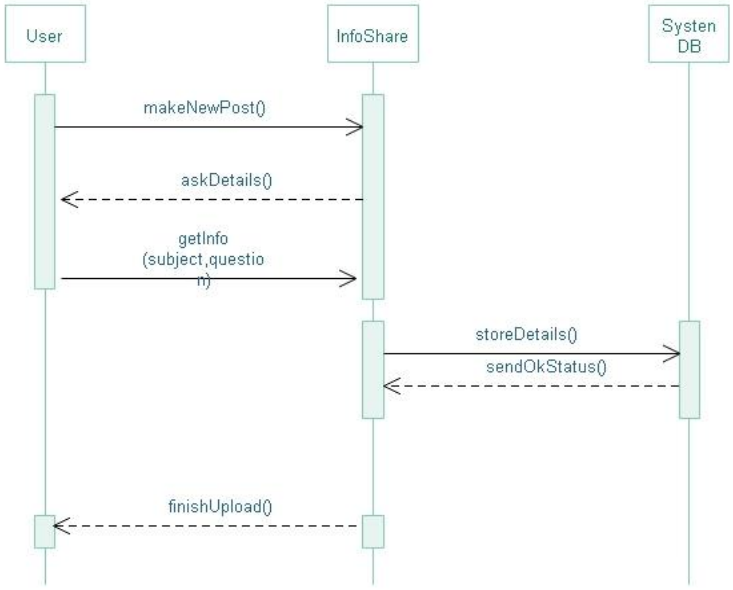

Figure 12: Sequence diagram for posting question

4.6.3 SEQUENCE DIAGRAM FOR POSTING ANSWERS

The diagram below describes the interactions of a user with the system while browsing and providing answers on the system. The customer browses the information made available by the system. The answer posted and upvotes and downvotes are recorded by the system database.

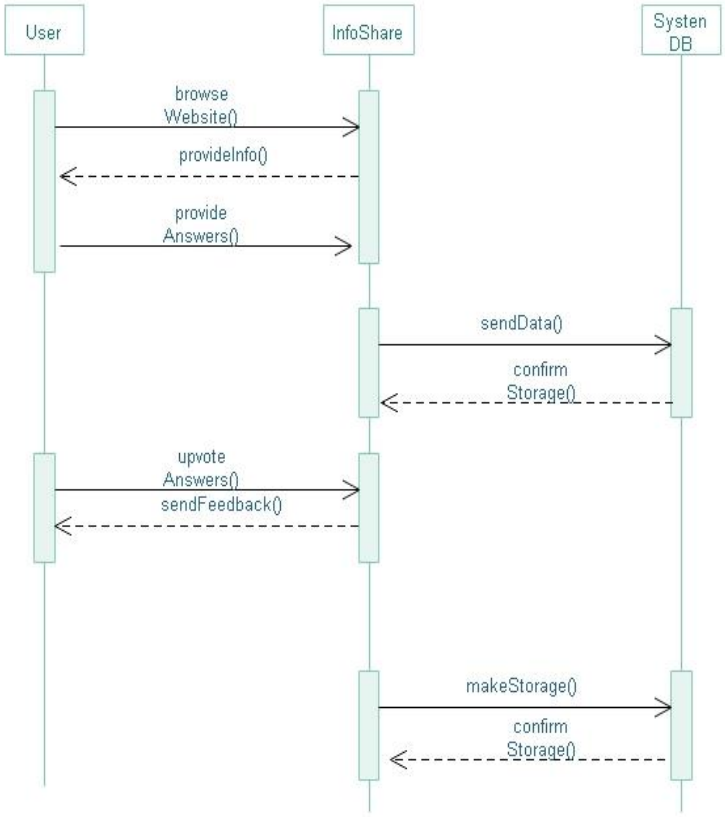

Figure 13: Sequence diagram for providing answers

5. TIME SCHEDULE ESTIMATION

The time schedule for the project has been designed according to the stages involved in the development of the system.

Task	First Increment Period	Second Increment Period	Third Increment Period	APPROX. DURATION(Days)
1.Requirement analysis and specification	4	4	2	10
2.Update analysis	2	2	2	6
3.System design	6	6	6	18
4.Produce requirement specification	1	2	2	5
5.Implementation and coding	4	9	9	22
6.Evalutation and testing	3	5	9	17
7.Develop documentation	17	33	20	70

Table 2: Time Schedule Estimation

5.1. INCREMENT 1

ID	Task Name	Start	Finish	Duration
1	Requirement analysis and specification	2019-08-12	2019-08-15	4.0 d.
2	Update Analysis	2019-08-15	2019-08-16	2.0 d.
3	System Design	2019-08-16	2019-08-23	6.0 d.
4	Produce Requirement Specification	2019-08-23	2019-08-23	1.0 d.
5	Implementation and Coding	2019-08-23	2019-08-28	4.0 d.
6	Evaluation and Testing	2019-08-28	2019-08-30	3.0 d.
7	Develop Documentation	2019-08-08	2019-08-30	17.0 d.

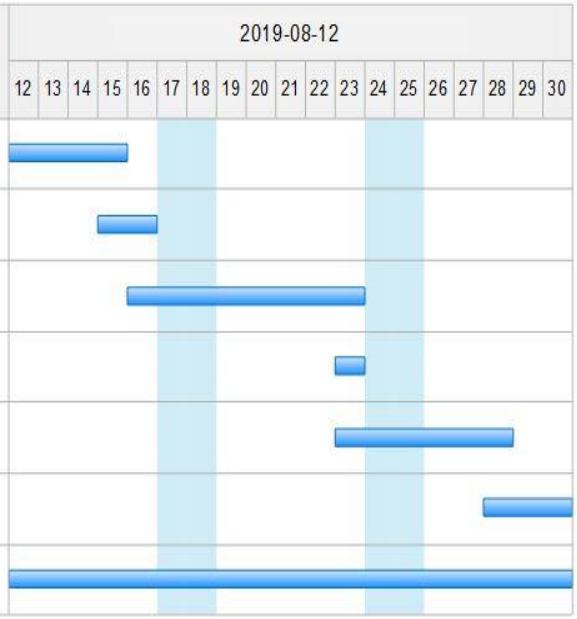

Figure 14: Gantt chart for Increment 1

5.2. INCREMENT 2

ID	Task Name	Start	Finish	Duration
1	Requirement analysis and specification	2019-08-30	2019-09-04	4.0 d.
2	Update Analysis	2019-09-04	2019-09-05	2.0 d.
3	System Design	2019-09-05	2019-09-12	6.0 d.
4	Produce Requirement Specification	2019-09-12	2019-09-13	2.0 d.
5	Implementation and Coding	2019-09-13	2019-09-25	9.0 d.
6	Evaluation and Testing	2019-09-25	2019-10-01	5.0 d.
7	Develop Documentation	2019-08-30	2019-10-15	33.0 d.

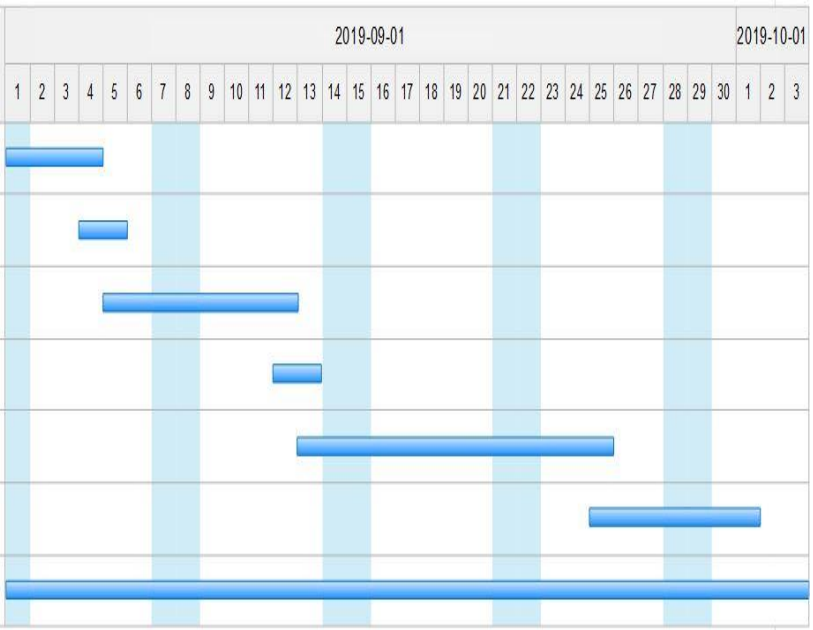

Figure 15: Gantt chart for Increment 2

5.3. INCREMENT 3

ID	Task Name	Start	Finish	Duration
1	Requirement analysis and specification	2019-10-03	2019-10-04	2.0 d.
2	Update Analysis	2019-10-04	2019-10-07	2.0 d.
3	System Design	2019-10-07	2019-10-14	6.0 d.
4	Produce Requirement Specification	2019-10-10	2019-10-11	2.0 d.
5	Implementation and Coding	2019-10-11	2019-10-23	9.0 d.
6	Evaluation and Testing	2019-10-18	2019-10-30	9.0 d.
7	Develop Documentation	2019-10-03	2019-10-30	20.0 d.

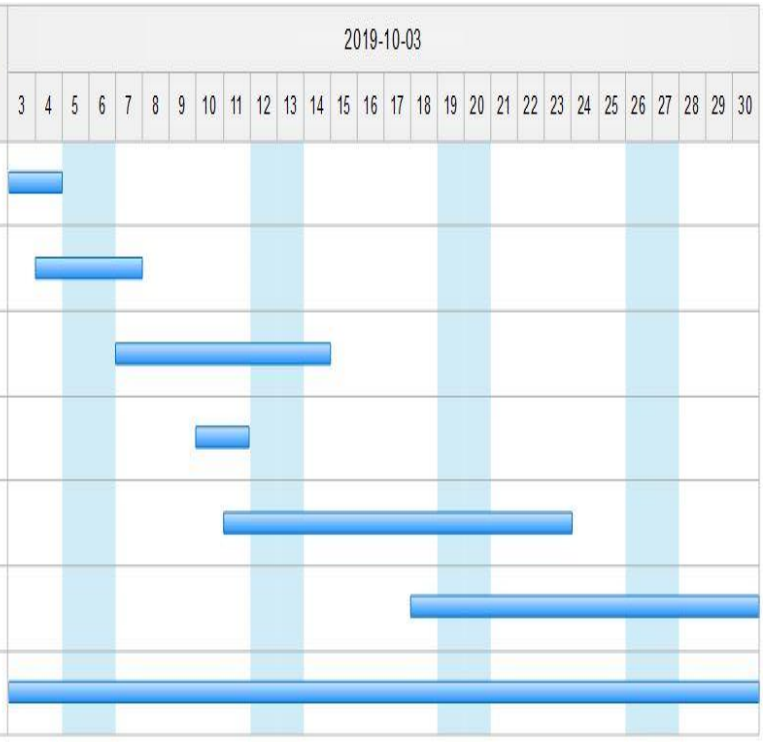

Figure 16: Gantt chart for Increment 3

6. TESTING

To make sure all the elements of our system developed function properly, we created test cases for our work, where validation, reliability and user acceptance were tested. The following testing table shows all the tests.

Test No.	Unit	Test	Expected Result	Outcome
1	Layout	Overall layouts of all the pages of the application.	Overall layouts of the application successfully developed	Success
2	Registration And Login	Check the working of the registration and login form	Users can successfully register and login with email and password	Success
3	Questions and Answering	Posting questions and their answers	Users can post questions and other users can answer them.	Success
4	Real time Voting system	Voting system for answers	Answers can be voted without refreshing the page.	Success
5	Search bar	A search bar for searching desired questions	Users can search for questions for finding answers	Success
6	Recommendation System	Recommending questions to the users	Users are recommended questions which they can answer	Success
5	Notification System	Notification system for users to be notified	Users are notified when their questions are answered	Success

Table 3: Testing Table

7. RESULTS AND CONCLUSION

Thus, our system, InfoShare is able to act as a platform for students and teachers to interact with each other. Students can post questions and queries. And other users who have the appropriate knowledge can provide answers and solutions and help them solve their queries. The system has a search bar and a voting system as well. Notification and recommendation system has also been implemented in the system. Using InfoShare, now students can post their queries and confusions and get solutions to their problems.

7.1. FUTURE ENHANCEMENTS

- There can be a following system so that users can follow each other and be notified when a user posts questions or provides answers.
- Advanced notification system and recommendation system can be developed.
- The project is limited to the students and teachers of one college. So, it can be made viable to students of different colleges.

8. BIBLIOGRAPHY

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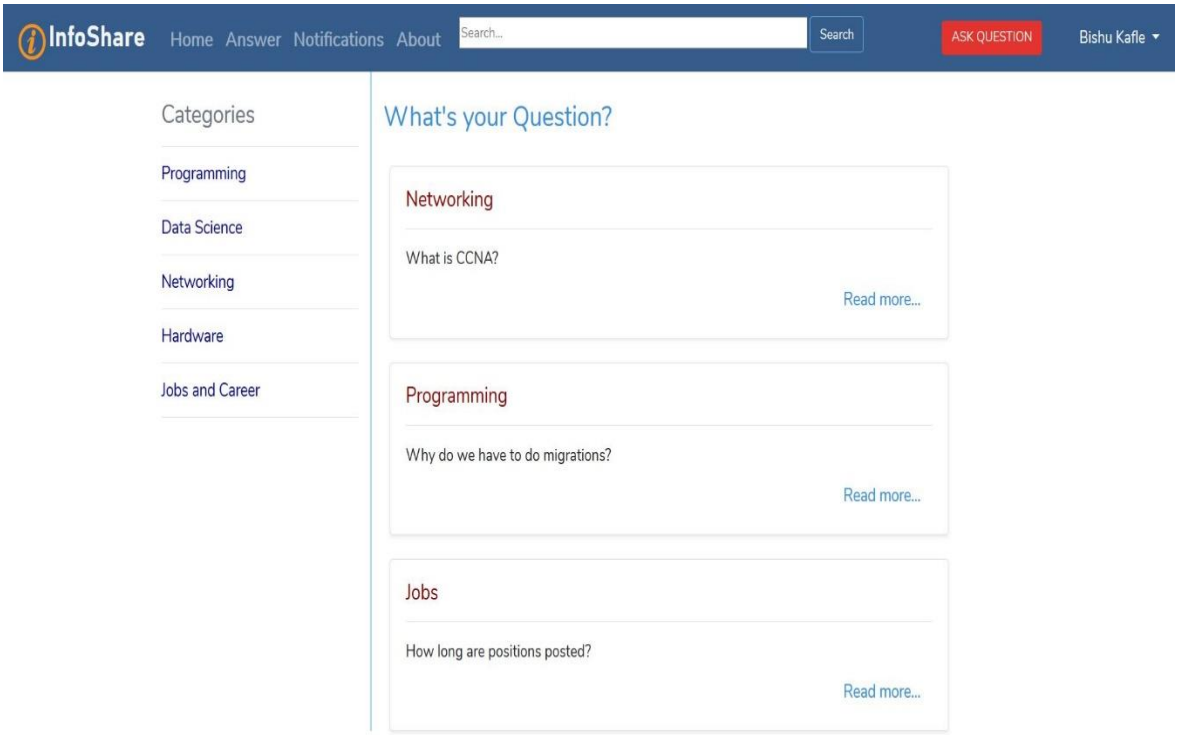
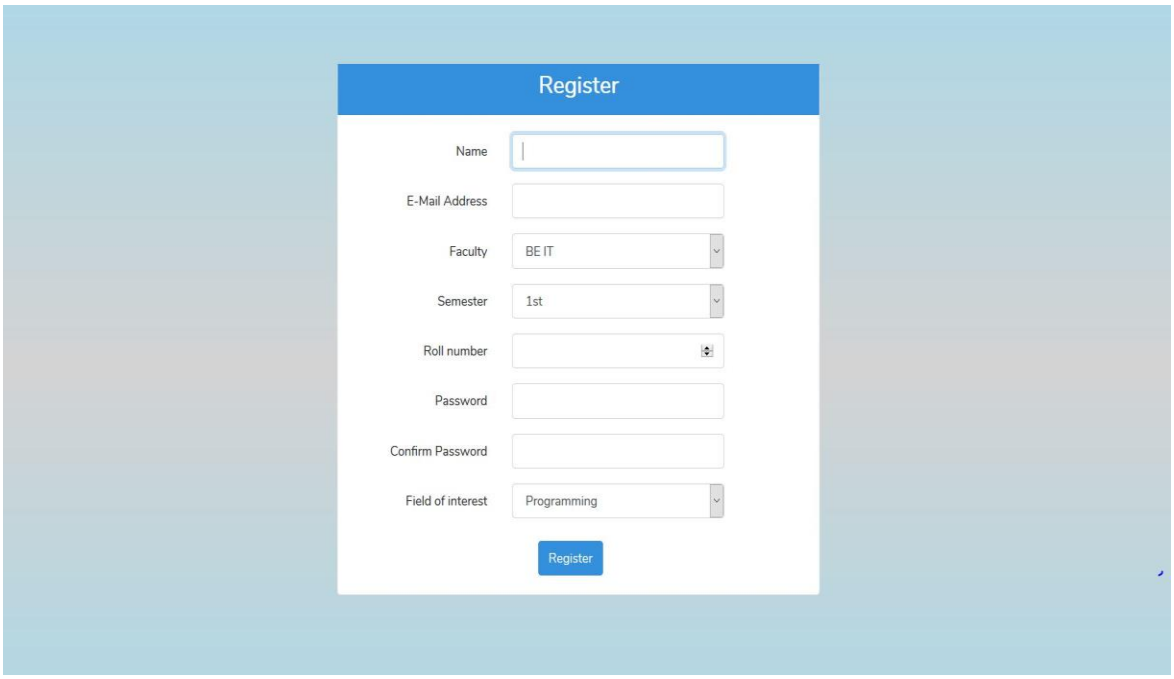
APPENDIX A

SCREENSHOTS OF THE SYSTEM

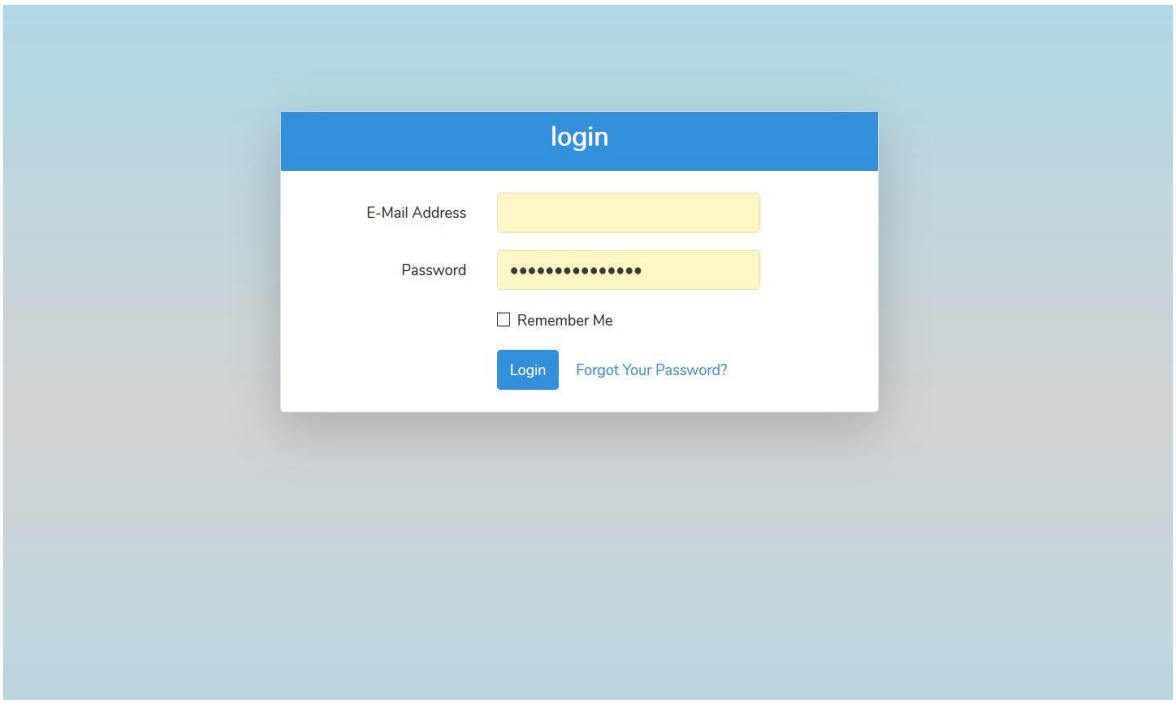
- **HOME PAGE**



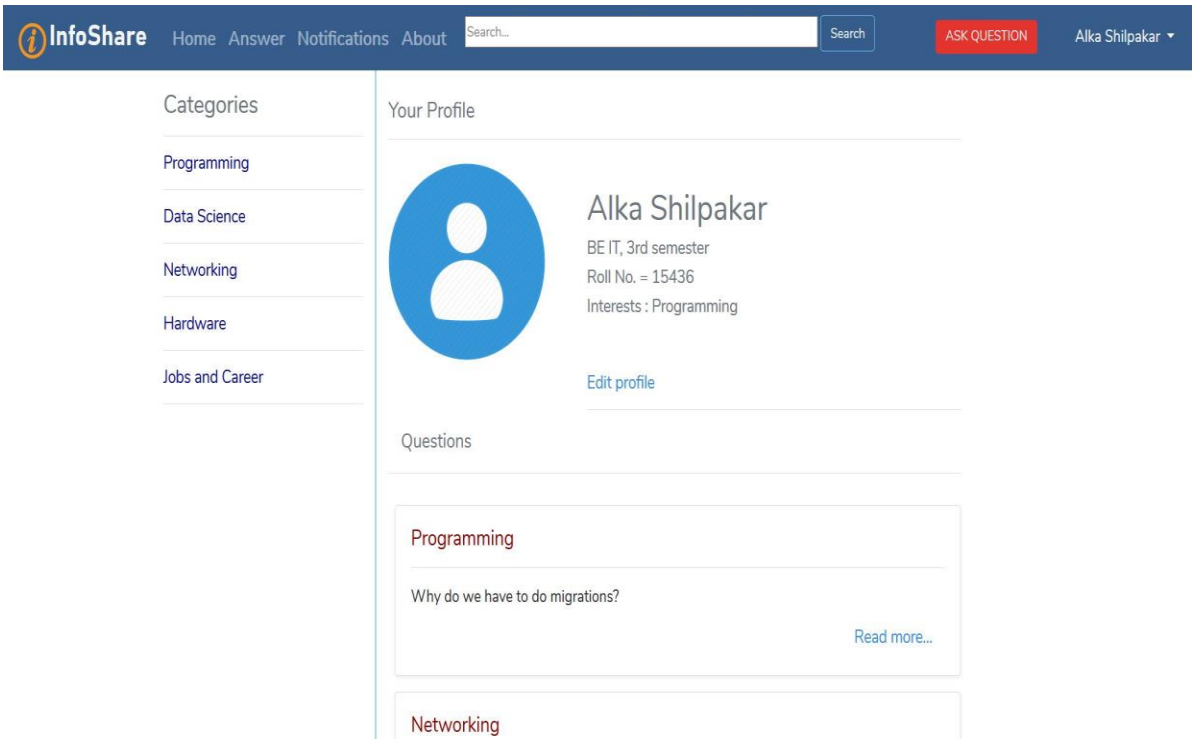
- **REGISTRATION**



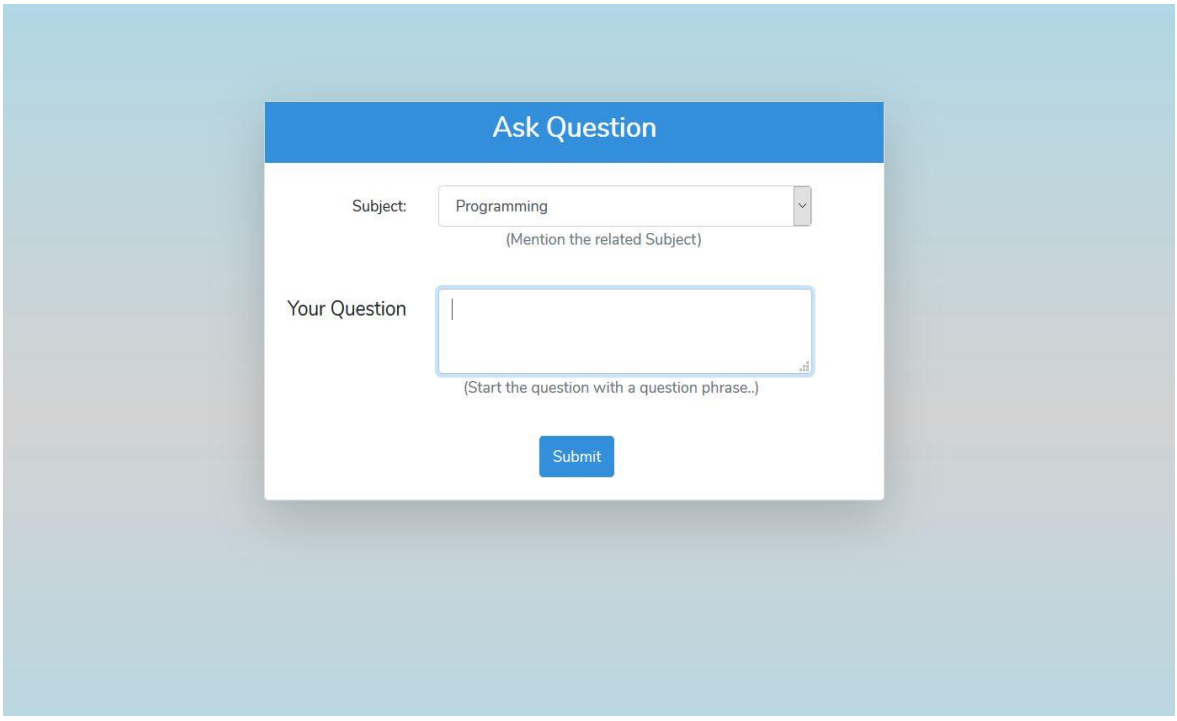
- **LOGIN**



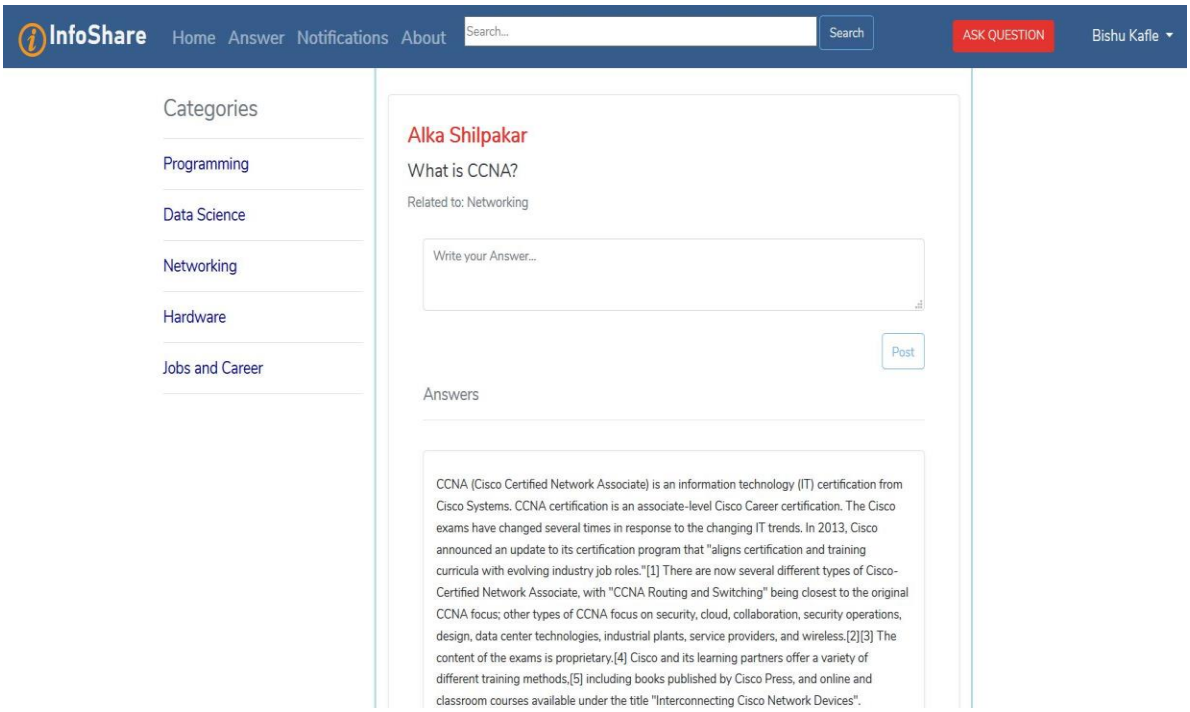
- **USER PROFILE**



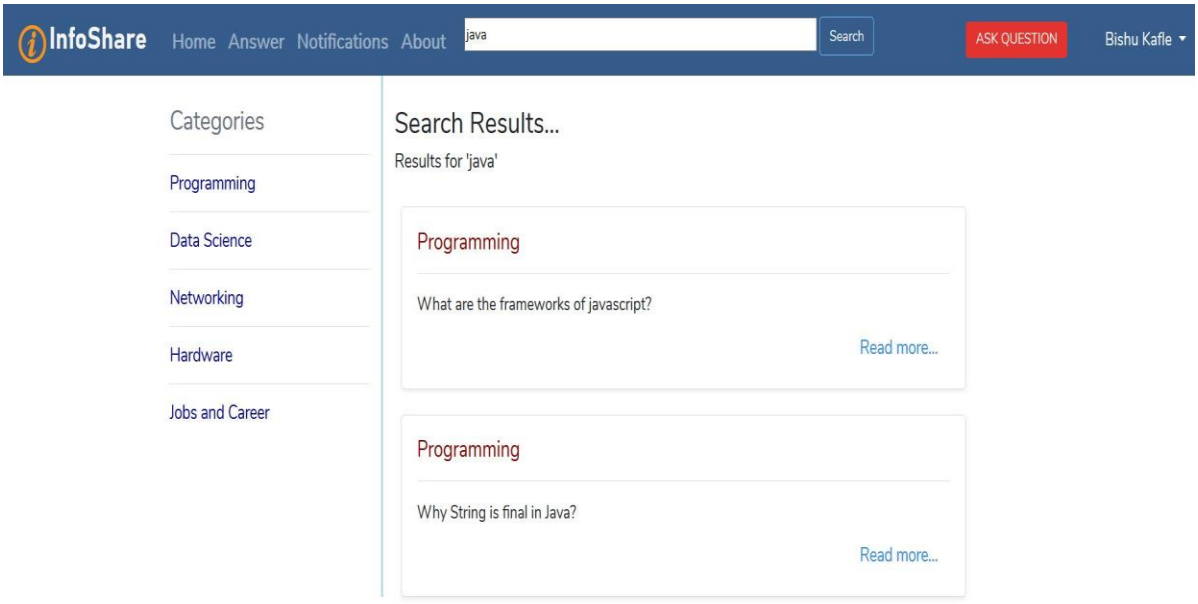
- **ASKING QUESTION**



- **QUESTIONS PAGE**



- **SEARCH RESULTS**



- **RECOMMENDATION PAGE**