



Peer-To-Peer Question Answering Platform Design And Implementation

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Abstract

Question Answering Platform empowers users (employees, students, etc) to obtain proper answers to the question that is in natural language and they are unaware of who is the right person to ask. Almost everyone faces problems in their organization and also faces difficulty finding out who to ask for the solution, the main trouble most of the time is we all didn't know who is the right person to ask, and we all experience that sometimes we get answered from the person we didn't even expect. To understand this problem in deep, we conduct a survey and after cleaning and processing the survey data we analyzed and we find almost 70% have chosen that their organization didn't have any solution for this problem, they are still facing the problem and asking their colleagues and friends to know who is the right person to solve their problems. to solve this problem we worked on it and find out a data-driven layered architecture on which we develop a platform that is isolated to an organization where the employee or member of the organization can raise their query and the query is further get recommended to the most relevant member on the platform who have high chances to able to give the right solution for the query. Further, we worked on the implementation part and complete the basic implementation of the project.

Keywords: Q&A System, peer-to-peer discussion platform, educational institution, question recommendation system.

1. Introduction

Information on the web is quite convoluted, there are plenty of blogs and websites providing information and the user is just left with a search bar. Thus if one doesn't know how to frame a question then the internet can never be judiciously used for learning. Even if there are social media platforms that facilitate everyone to find the right kind of people still searching for them is a daunting task.

Through CollegeQues students won't face such problems as the platform would only comprise students and professors creating an educational environment. CollegeQues is a social question-and-answer platform that will assist users in finding solutions to their questions through the community we will create. It differs from other platforms such as Quora or Twitter in that we will target specialty audiences such as students and assist them in obtaining answers to their questions not just from their peers but also from college professors. The software will be able to create a community for college students and staff to interact. This would also allow students from other colleges to communicate with one another and learn about the domains of their interest. The platform provides an option to ask questions

anonymously, which makes it more convenient compared to other platforms for students hesitant to ask questions in front of others. This site will also be useful to students who have progressed in their life and require guidance from alumni. Students will again receive assistance from their college seniors as well as from individuals from other universities, resulting in the formation of a community. The application would recommend comparable questions and assist users to meet other users interested in the same topic based on their prior searches and question domain. UI of the application has been designed by implementing HTML, CSS, JavaScript, and Bootstrap. All the pages on the internet are fundamentally based upon HTML and the websites are made attractive using CSS. To make the pages dynamic availing users with various functionalities, JavaScript is applied. Bootstrap 3 was designed specifically for mobile devices and to implement HTML tags and CSS properties in that framework, HTML5 Doctype is required. For managing data at the servers, backend technology is used and out of many such tools, Python and Django have been implemented for the project. Django is a free and open-source web framework built on Python and it follows the model–template–views architectural paradigm.

A database is required to store and manipulate data according to the requirements of the user. MySQL has handled this facet of the application efficiently. MySQL is a relational database management system that is free and open-source (RDBMS). A relational database organizes data into one or more data tables where data types can be associated with one another, storing the data in a proper structure.

2. Methodology

This research paper explains the need for a platform that provides a peer-to-peer connection between the participant of an educational institution, or other organization, by which the participant can sort out any queries related to their institution/organization or any other. We have conducted a form-based survey to understand others' opinions and find out their views on having a platform only focused on their institution/organization.

2.1 Data Collection

A survey form was created and distributed by our team members to potential participants including their friends and family members who are

currently in an educational institution or an organization. The survey was created in a Google Form and the results were exported to Google sheet to be further examined.

The survey is focused to explore the public opinion that is currently or previously belonging to any education institution; the survey is broken down into three parts. I. Availability of any other platform. II. What Problem faced by people III. Opinion about having a Platform that solves their queries related inside their organization. The survey consists of multiple-choice questions and a few short answer questions, All the Questions in the survey form are easy to understand and the participants can relate it by their personal experience.

To assure the privacy of the participants we make sure that we cut down the question which may breach the privacy of the participants, we use Google forms for the survey which comes with privacy and security above the mark to keep the data secure and safe, It includes modern malware protections and data stored in the cloud infrastructure. The transmission between participants and the cloud storage is encrypted with modern encryption algorithms [8].

2.2 Data analysis

For the data analysis of the survey, qualitative analysis is mainly used; we have done the quantitative analysis as well. In the survey, most of the questions have non-quantified answers, and few questions have direct Yes or No type answers, all quantitative analysis is conducted with Google form default response graph, and the qualitative analysis is conducted through analyzing the sentiment of the answers.

3. Peer-to-peer e-learning Discussion Platform Model

This model is based on layer architecture, while behind it relies on a data-driven model, and using this model we have built a peer-to-peer e-learning discussion platform (CollegeQues). The peer-to-peer e-learning discussion platform model is apt to serve client-server applications at the project level by resolving different problems like security, adaptability, expandability, robustness, etc. [8][9].

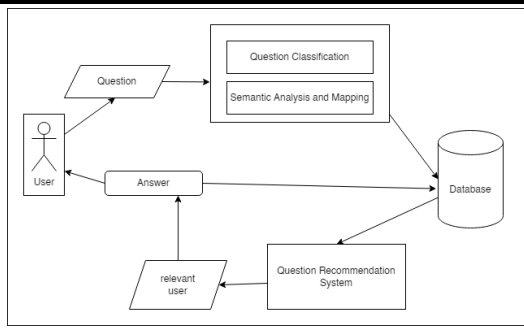


Figure 1: Block Diagram of CollegeQues

Data-driven modeling techniques rely on underlying huge data and continuously generating data. These models get improved over time using different machine learning techniques.

In the CollegeQues project, we are using data-driven modeling techniques to achieve target sentiment analysis and auto-categorization of the queries, which helps the model to suggest the question to a person who is more fitting to the question, which increases the chance to get a clear-cut answer.

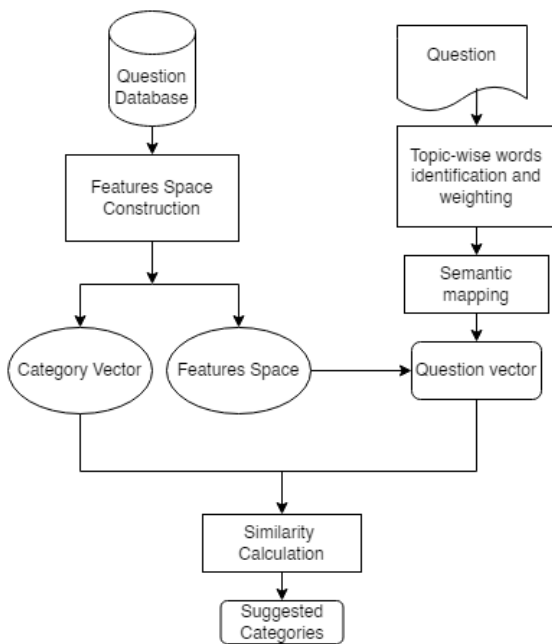


Figure 2: Question Categorization Model

The question categorization model wholly and solely relies on the short text classification methodology. Automated Question Categorization is a key component of our project, which classifies the question and provides a proper document timely with high accuracy.

As shown in Figure 2 Question Categorization Model, On the left side we are training the model using a question database and continuous generating questions data, which generate category vectors and features of certain categories of questions [10]. And On the right side when a

real-time question is created by the user, our model first splits the question sentence into words and creates a weighted rank of each word, and generates a semantic map which further re-converts into question vectors, and in the final step using question vector and categories vector, the model calculates similarity vector and give the final result as the accurate category for the question.

4. Implementation of CollegeQues

In this project, we've created a question-and-answer platform where the user can ask a question and it can be answered by any other user. Here the user will ask a question, the question will be sent to question classification. It will then be categorized and stored in a database which will get mapped along with its Metadata. Now we'll use a question recommendation system that will recommend questions to a user on the basis of their Metadata which includes their qualifications, likes, dislikes, and interests [11]. The question will be recommended to a relevant user who can answer that question. The question can be answered by multiple users also having multiple and accurate answers. Advantages of using our project First and foremost your questions will get answered. You can ask a variety of questions our mechanism will work in such a manner so that your questions will get answered by other users [12].

You'll find various users having the same liking, interests just like you. You can connect with them to expand your knowledge.

You can help other users by answering their questions and guiding them with a proper solution.

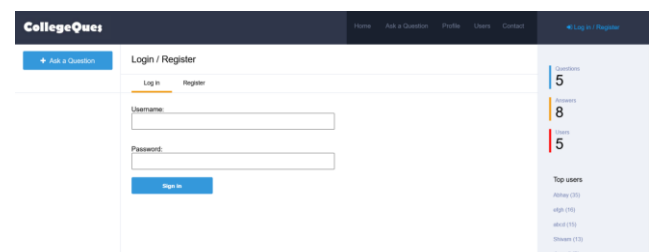


Figure 3: User Login/Register Page

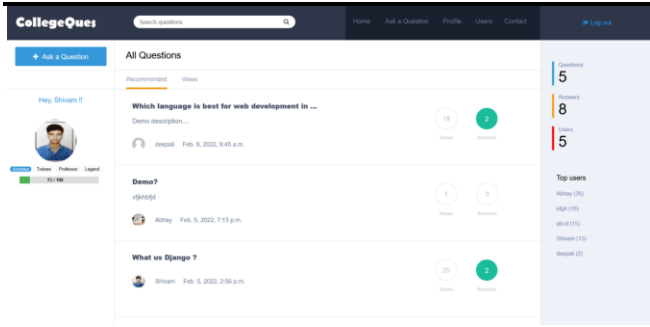


Figure 4: User Homepage

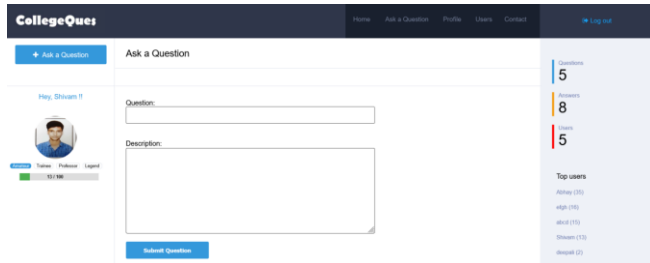


Figure 5: Ask Question Page

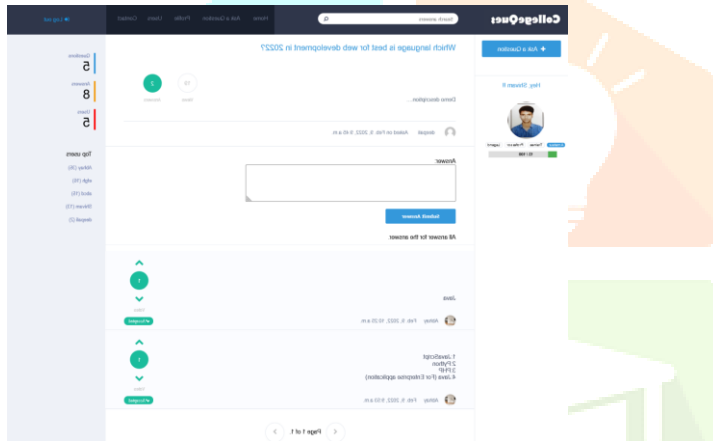


Figure 6: Submit Answer Page

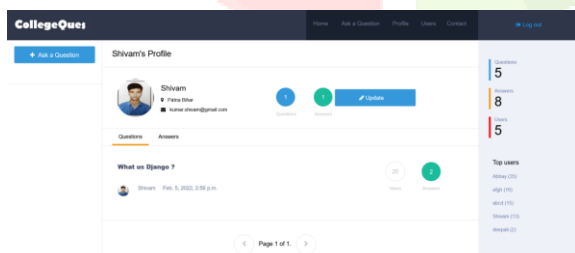


Figure 7: User Profile Page

5. Result

After collecting survey data, which is shared with participants of the different educational institutions. We share the survey form with different people having working or studying in various organizations across India and we collect the participants from more than 10 different educational institutions.

What do you think of having a central platform to solve any queries in your organization ?

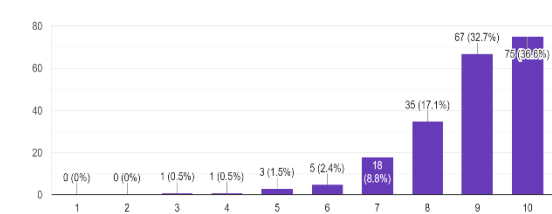


Figure 8: Graph of Data Collected from Different Organizations

The survey data is further processed and analyzed, after analyzing the data we found that most of the education institutions did not have any platform to solve the query related to their organization. The result of the survey for having any such platform is 87% of the participant organizations didn't have any such platform and 17% of the participant did not confirm having such a platform as shown below in Figure 9.

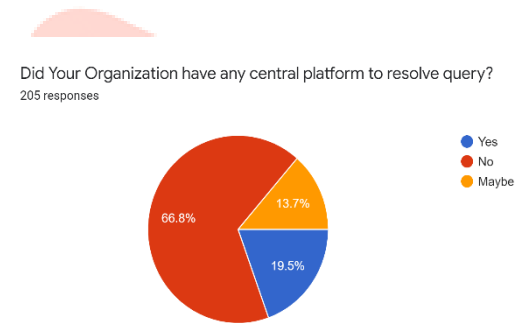


Figure 9: Pie chart representation of having a platform to solve a query

Based on the survey result we found that most education institutions did not have a platform on that where the member of the institution can raise here queries and the queries resolved by the relevant member of the organization. So we decided to work on the problem and implement the basic concept of the platform which is elaborated in the implementation part of this paper.

6. Conclusion

A Question- answering platform has been presented for departmental use, a social question-and-answer-based platform that will help the user get the answers for their questions via the community we will build. In this, we are focusing on niche audiences like students and will help them get the answers to their questions not only from their fellow students but also from the college professors. The platform will be able to

build a community for college for various interactions with the staff and students. This will also help the students of various colleges to interact with each other and learn about the specific domain they are interested in. We will also have a feature to drop the questions anonymously which will act as an advantage over other platforms for the students who are too shy to ask questions publicly. It is based on NLP which categorized the content according to student's interest, search, and domain. Central management of course information has also been added as a feature to the e-learning platform. The administrator supplies information and content for all related courses and questions to the e-learning database, Html pages, and information for all courses are automatically generated.

7. References

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