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Project Proposal

Vision

In school, there are various scenarios that could hinder a student from asking the professor a question: the student may have a fear of public speaking; the teacher could have missed the student's raised hand; a student's question may be stunted by a time constraint (e.g., class ending) or the transition into a new topic. Regardless of the possible reasons, students oftentimes will never ask their professor to clarify an area of confusion once their question is outside the scope of its discussion in lecture. In the case where the student seeks the answer from their teacher, they can do so through email, posting on a discussion board, or going to office hours. All these alternatives must be done outside of class which could be forgotten by then or have an indefinite time period of waiting for the answer. These situations not only prevent students from getting the most out of their classes but it also does not give the professor a clear understanding of how much the class understands. These misunderstandings lead to tests that are too hard or too easy. Furthermore, students could fall behind and this can lead to bad course experiences for everyone.

Our proposed project alleviates all the previously discussed issues by offering a real-time application where students can submit their questions to the teacher during lecture. Once submitted, the professor is able to either answer them directly in class. The questions are saved such that if all the valuable questions were not able to be answered, they could be addressed after class either directly or through the class forum or discussion board. The questions can also be analyzed to help the course staff identify trends. Topics that had more questions could mean that it needs more explanation from the professor whereas topics with less questions could mean that students obtained a solid understanding of the material and the professor could move on to a topic that needs further attention. The system could also allow for suggestions or comments during class that the professor could look at after class to understand what were effective teaching tools and what methods need improvement. As a result, this project would generate value not just for the students' education but also increase the quality of the school in identifying areas of improvement; as more timely suggestions, comments and data are available to the course staff, they will be able to improve their teaching methods immediately.

Software Architecture

This system would mainly be a website that would allow for two different accounts: a student account and an instructor account. At the beginning of each term, the instructor would first create a discussion group for the course and students that are enrolled in the class will be automatically added to this group. Every class session thereafter, the instructor would open the discussion and students will be able to post questions, comments, and suggestions to the board. The instructor can then choose to answer them as they come in or set aside time to address inquiries at a later time. Specifically, the instructor can choose to answer or archive feedback or perform data analysis to identify learning trends in the class. Another feature that will be implemented is the ability for the instructor to start polls and questions during class. This would allow every student to be able to answer the questions and participate without having to raise their hand and take their turn. Other students could then even comment on answers, voting them up if they find the answers interesting (see Figure 1). This would bring so much more interaction into the classroom, especially in larger lectures.

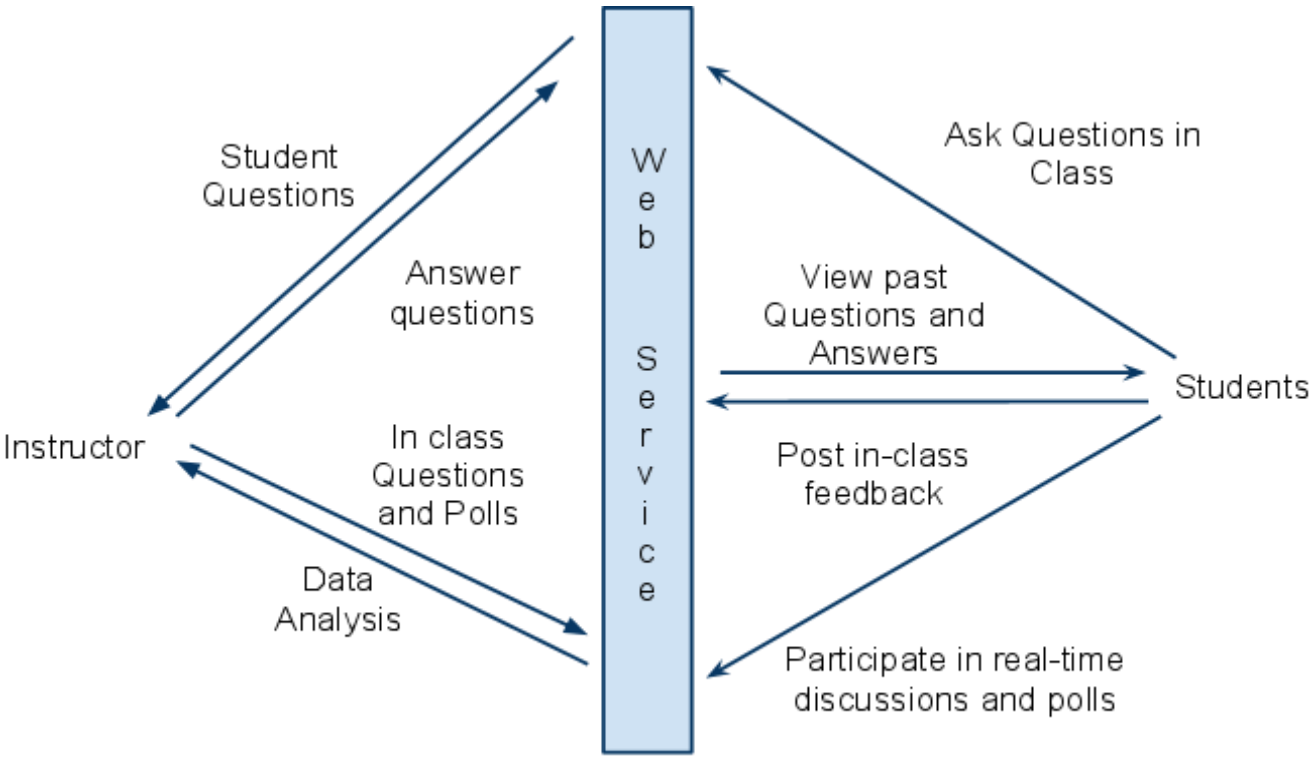

Figure 1. High level diagram of application.

Although we are still in search of all the types of technologies that would help enable us in implementing this project, it is necessary to build this system utilizing web application libraries. Our initial proposal is to build the web application on Google apps. We will use HTML, CSS, Javascript and/or Ajax for front-end user interface and PHP libraries for the server-side scripting. On the back-end, we will use Java as well as SQL libraries for the database. We also would utilize machine learning algorithms to perform the data analysis to identify trends and group questions together to make the data more manageable.

Challenges and Risks

The most serious challenge would be to balance the privacy and security features of this project. We want the postings to be somewhat anonymous to encourage student submissions. Conversely, having an absolutely anonymous service invites malicious students to behave inappropriately while using the application. A way to minimize this risk is to research many models of deterring spam and from this gathered information, choose the best model. Another foreseeable issue is managing the data. For larger classes, if there are many students then the flood of questions would lower the value of this application as it may be impossible to find the relevant data due to too much data. Therefore it will be very important to make the information manageable. One way to mitigate this risk is to research different relevancy algorithms.