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Agora

A Social Discussion Website Database System

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Project Proposal | Developing a Database Application

Contents

1| Introduction

This report is submitted as a project proposal as part of the CS 353 Database Systems term project. Agora is present is a social discussion website database resembling Reddit, Quora, or StackOverflow. The report details solicited description of the term project, the functional and nonfunctional requirements, limitations, and Entity-Relationship model of the project, respectively.
Progress of the project can be followed through https://github.com/selinozdas/CS353.

2| Project Description

Agora is a social discussion website that can be used to discuss subjects such as news events, politics, distinct skills knowledge, inquiries, academics, interests, or personal life. Agora has the potential to bring users together who want to ask, learn, share or discuss a variety of subjects. Our system will be a collection of individual knowledge. Visitors can view Agora forums, but these visitors will not be entitled to certain privileges pertaining to registered users. These privileges include subscribing to channels, posting, commenting, rating, and reporting forums or comments. Registered users must have accounts with passwords and unique usernames.

Since social discussion applications (e.g. Reddit, Stackoverflow or Quora) consist of many entities and relations, there is copious information needed to be stored and managed. Database management systems are suitable for these social discussion applications, due to their provision of a highly efficient method to handle multiple types of sizable data. Another motivation to use a database management system is the dynamic data flow in our system. Agora must be quickly accessible and easily-updatable in case of changes or extensions. A database management system is suitable for the defined requirements in section 3 of the report. For example, our system must be accurate and secure and must avoid data redundancy which can be achieved with an efficient database design. Therefore, Agora will employ a database management system [1].

3| Requirements

The “Requirements” section of the report lists the nonfunctional and functional requirements. The requirements are from the perspective of three users of the system, which are visitors (i.e. visitors of the page that are not registered with an account), registered users, and administrators.

3.1| Non-Functional Requirements

The non-functional requirements of the system are detailed below. Our system design must adhere to these software criteria.

- Performance: Fast response time is crucial for the system especially as the database enlarges.
- Usability: The system should be easily navigable and simple for the user. This includes a straightforward and familiar user interface but is not limited to the user interface. For instance, the system should not have excessive features to avoid confusion.
- Reliable: The system should have minimal errors and bugs. If such technical errors are encountered, the system must inform the user. To ensure that the system is reliable, tests are essential.
- Security: The system must protect sensitive user information such as passcodes.
- Maintainability: The system must be simple, so it is easy to maintain. For example, to better follow the maintainability requirement, the system must have a smart database design or clean and commented code.
- Extensibility: The system should be designed such that as the database enlarges and features need improvement or upgrading, it is simple to extend core functions.

3.2| Functional Requirements

The functional requirements are listed as follows. These are specific expectations from Agora.

- The system should provide the option to create an account (with an email and password) identified by a unique username. The system also assigns the registered user a profile, where the user may have a profile picture as well.
- Agora must have channels (categories) within which forums are posted. Comments are posted under forums.
- The system should allow a channel, forum, or comment to have tags(such as that in youtube) to aid “searching” either within the website or through search engines.
- The system will allow a visitor who is not logged into the system to view forums and comments as a silent observer. The system will not allow a visitor to, for example, contribute to the forum other than viewing it.
- Agora permits registered users to have privileges such as creating a forum, commenting on a forum, rating a comment, reporting a comment, or creating a profile.
- The system will permit the owner of the post to mark comments with a “helpful” flag. The system will show this comment first on the forum after it is marked with a “helpful” flag.

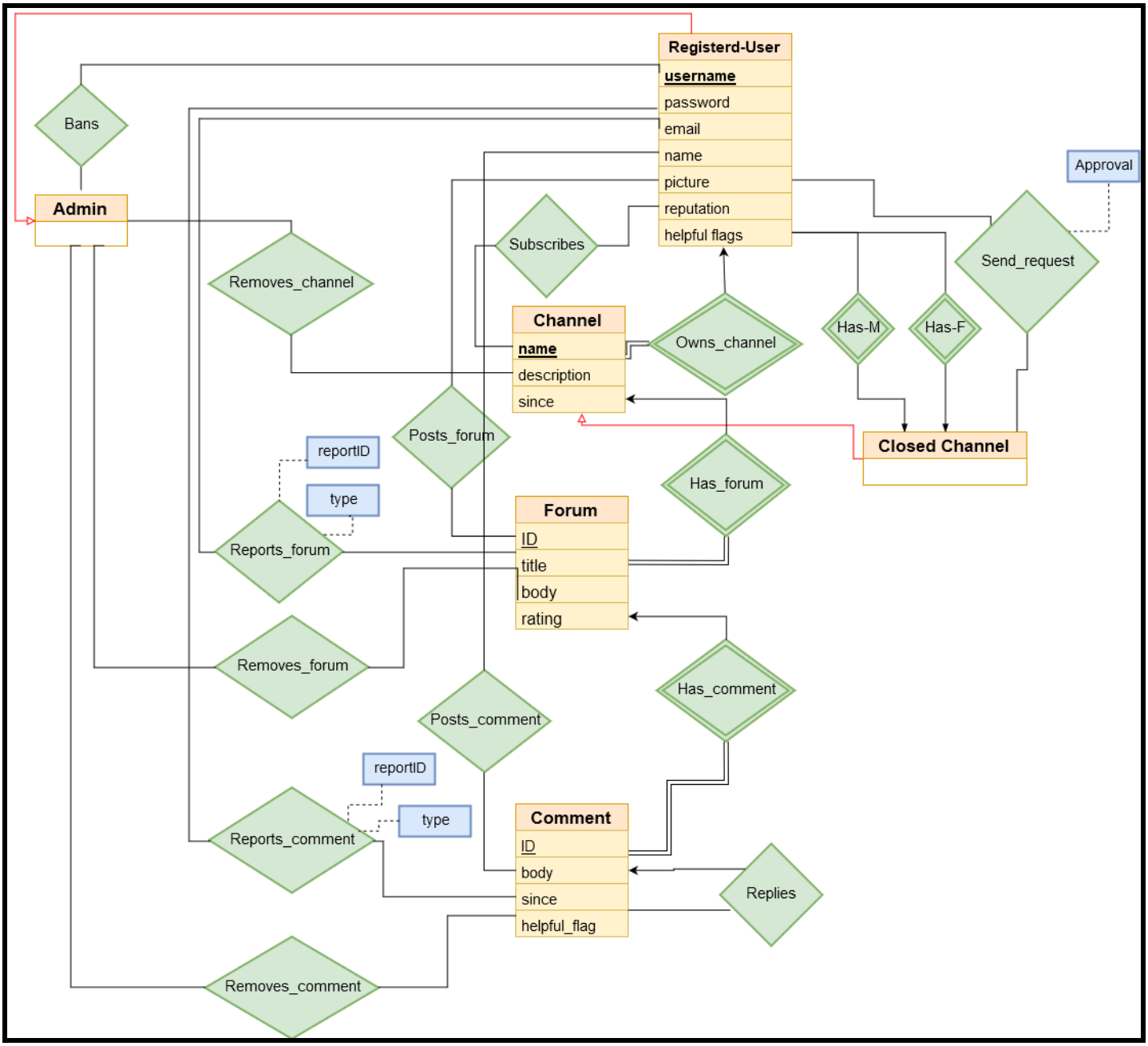
- The system should allow registered users to create new channels if they have collected at least forty “helpful flags.”
- The system should provide registered users with both the options to start a new forum and contribute to an existing one.
- The system will allow the registered user to rate comments , both positively and negatively, by upvoting and downvoting. This contributes to the reputation who originally commented. A user’s reputation score on their profile page.
- The system will track the reputation of each user according to rating scores as aforementioned; and users who have not earned enough reputation will have some limitations as not being able to post profile pictures.
- The system authorizes administrators to remove any channel, forum or comment.
- Agora gives a user the authority to submit a report form in response to a comment or forum to administrators.
- The system allows registered users to post the same forum in distinct channels. This is because some channels may be closed or private, and the user may want to post the same forum in an open channel.
- The system will allow the owners of a channel to make the channel closed to a specific audience. The owners may appoint other registered users as moderators. In this case, registered users must ask permission from the moderators or the owner of the channel to subscribe, view, or contribute to forums in the channel.
- Agora allows registered users to subscribe to channels, posts, comments or users.
- Agora stores a registered users forum or channel subscriptions.
- The system will show all authorized users their subscribed channel and forums on the website homepage.
- The system will allow both registered and unregistered users to “search” within the website for channels, forums, other registered users, and comments.

4| Limitations

- The system is targeted towards three users, who are unregistered viewers, registered users, and administrators.
- The system will not allow users to post a forum or comment, report, rate a forum or comment, and create a profile if they have not logged into their account.
- The system will allow the user to limit the amount of information shown in their account profile seen by the public.
- The system permits users to rate rate the same post only once.
- The system permits the users to have a distinct and unique ID. Other users must not have the same ID. The system permits the user to post only one profile picture.
- The system allows the use only 40 downvotes/upvotes (forum or comment rating points) in a day.

5| Agora Entity-Relationship Model

5.1| Entity-Relationship Diagram



This entity relationship model displays core relationships and entities. Each will be explained in further detail on the following page.

5.2| Entity-Relationship Diagram Description

- There are six main entities, which are |Registered-User," "Admin," "Channel," "Closed Channel," "Forum," and "Comment." These entities are the yellow boxes with bold titles. For the purposes of this report, the entity tiles will be treated as general nouns in the bullet points below.
- Bold and underlined attributes mean primary key. Underlined attributes mean partial key. Red arrows with empty arrowheads are "is-a" relationships.
- Registered-user entity has the primary key "username."
- A registered-user can subscribe to a channel or forum, can post a forum or comment, can reply to a comment, report a forum or a comment, and send requests to join a closed channel.
- An administrator is a registered-user, which means that it has all the attributes of a registered-user but has additional relationships with other entities. These are as follows:
    - Administrators can ban registered-users if the report against them is substantial.
    - An administrators can remove a channel, forum, or comment.
- A registered-user can own a channel, with conditions as aforementioned.
- A channel has multiple forums. Its primary key is its name. If a channel is deleted, all the related forums must be deleted.
- A forum has multiple comments. Its primary key is its ID. It is only unique to a specific channel. The same forum title can be under multiple channels. It is not unique globally.
- A comment can be a reply to another comment. A comment has partial key ID. A comment ID is unique within the forum-comment relationship.
- A channel can be a closed channel, in which case a registered-user must send a request to join the closed channel. A closed channel has a registered-users that are the moderators and registered-users that are the followers.
- When a registered-user reports a forum or comment, additional keys are reportID and type of report (e.g. spam, violent, abuse.)

6| Conclusion

Agora is a web-based social discussion platform. These users can search through channels according to their interests and find related subjects. Agora will have an optimal database system design to handle our aforementioned requirements and a user-friendly graphical user interface.
In this report, details of the project such as the the overall project description, functionalities, design goals, limitations, constraints, and database design through the entity-relationship diagrams were explained.

7| References

1. "What is database and why do we need them?" http://www.softwaretestingclass.com/what-is-database-and-why-do-we-need-them/