Bilkent University

Department of Computer Engineering

CS 353

Database Systems Project

Online Technical Interview Preparation and Coding Platform

Project Proposal

Project Group No: 10

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Online Technical Interview Preparation and Coding Platform

1. Overview

This proposal gives information about the online technical interview preparation and coding platform. The proposal starts with a description that explains why this project is implemented and who will use it.

2. Project Description

Online technical interview preparation and coding platform will provide a platform for companies and users. By this platform, users will be able to practice coding by solving coding challenges, participating in coding contests and answering non-coding questions. Our program will provide users to choose a category to practice or they can simply ask for random challenges. Every challenge that has been solved by a user will increase their progression in a category. If all challenges in a category is completed the user will be rewarded with a badge.

Non-coding questions can be answered by multiple users, these answers can be upvoted or downvoted by other users. The correctness of these answers will not be checked by the system, they will be evaluated by users instead by these upvotes and downvotes. These questions are like discussions towards a subject.

Coding contest are time limited special events which consists of one or many coding challenges. Users will be ranked according to their solutions' correctness, which will be checked by outputs for given test cases.

Coding challenges are simple coding questions which differ in many categories. Practice questions and contest questions will be separate.

These coding challenges, coding contests and non-coding questions will be prepared by editors. Companies will also prepare coding challenges and non-coding questions. Companies will be able to evaluate users as an interview by questions that they create.

Our system will support these features by keeping the information of users, editors, companies and the collection of coding challenges, coding contests, non-coding questions in the database.

3. Why/How a Database System Is Going To Be Used

The system we will design requires a database management system due to the need for persistent data storage [1]. There will be different type of users in our system and their information must be stored in a database. Moreover, actions such as creating or solving a question in the system need to be regulated and the information about the users' progress on a coding challenge should be updated in order to avoid inconsistency or confusion.

The database is going to provide the means to manage all data related to the system we are working on. We will use the database system in order to search for the information that users' desires such as the category or the company name of a coding challenge. Furthermore, the database will be updated by creating new data entries or updating the current ones based on different actions. Some of these actions are adding coding challenges, non-coding questions or coding contents and solving them or making a progress which will be done by users.

4. Requirements

4.1 Functional Requirements

Authentication for each end-user will be provided to classify the functionalities of users. End-users accounts and their functionalities are determined as given below:

4.1.1 End-Users

4.1.1.1 Editor:

Editor will be able to :

- Prepare coding challenges, coding contest and non-coding question
- Edit questions that are prepared by same editor before.

4.1.1.2 User:

User will be able to :

- Participate coding contests
- Solve coding challenges
- Answer coding challenges
- Evaluate coding challenges

4.1.1.3 Company:

Company will be able to :

- Prepare non-coding questions
- Prepare coding challenges
- Prepare Interviews that includes some of coding challenges and non-coding questions.

4.1.2 Entities

4.1.2.1 Coding Challenges:

Coding challenges will include a challenge id as a primary key. Question,solutions and test case are other attributes of coding challenge. Coding challenge consist of only one coding question and also has a many-to-many binary relation with coding contest. Coding challenge also has a relation with editor to provide authentication for database system.

4.1.2.2 Coding Contest:

Coding contests will include a contest id as a primary key. Leaderboard and time are other attributes of the coding contest entity. Coding contest also has a many-to-many binary relation with coding challenges.Such relation is to provide information about challenges that are included in coding contest. Coding contest also has prepares relation with editor, which provides authentication functionality for system via checking editors of the questions.

4.1.2.3 Non-Coding Questions:

Non-coding questions has a question id as a primary key. Other attribute of the non coding question entity is question, so each non coding question consists of one question and has prepares relation with editor. Prepares relation make it easier to determine the questions which are prepared by editor, which is important for authentication.

4.1.3 System Requirements

- System should be able to archive coding challenges respect to their usage category, which are coding challenges for contest and coding challenges for practice.

- System should be able to differ the preparer of the non-coding questions and coding challenges.

- System should be able to differ past interviews and new interviews.

4.2 Non-functional Requirements

4.2.1 Security & Safety

- Each password should be longer than 8 characters and should contain a number, upper case character and a special character.
- The system will not allow normal users or companies to create coding contests.
- The system will ensure no personal data is accessed from third parties.

4.2.2 Response Time

- The response time for a user action will be no higher than 5 seconds.

4.2.3 Reliability

- The system should not have any data corruption and data loss after a submission.

4.2.4 Usability

- Users should be able to use the system with at most ease.

4.2.5 Concurrency & Capacity

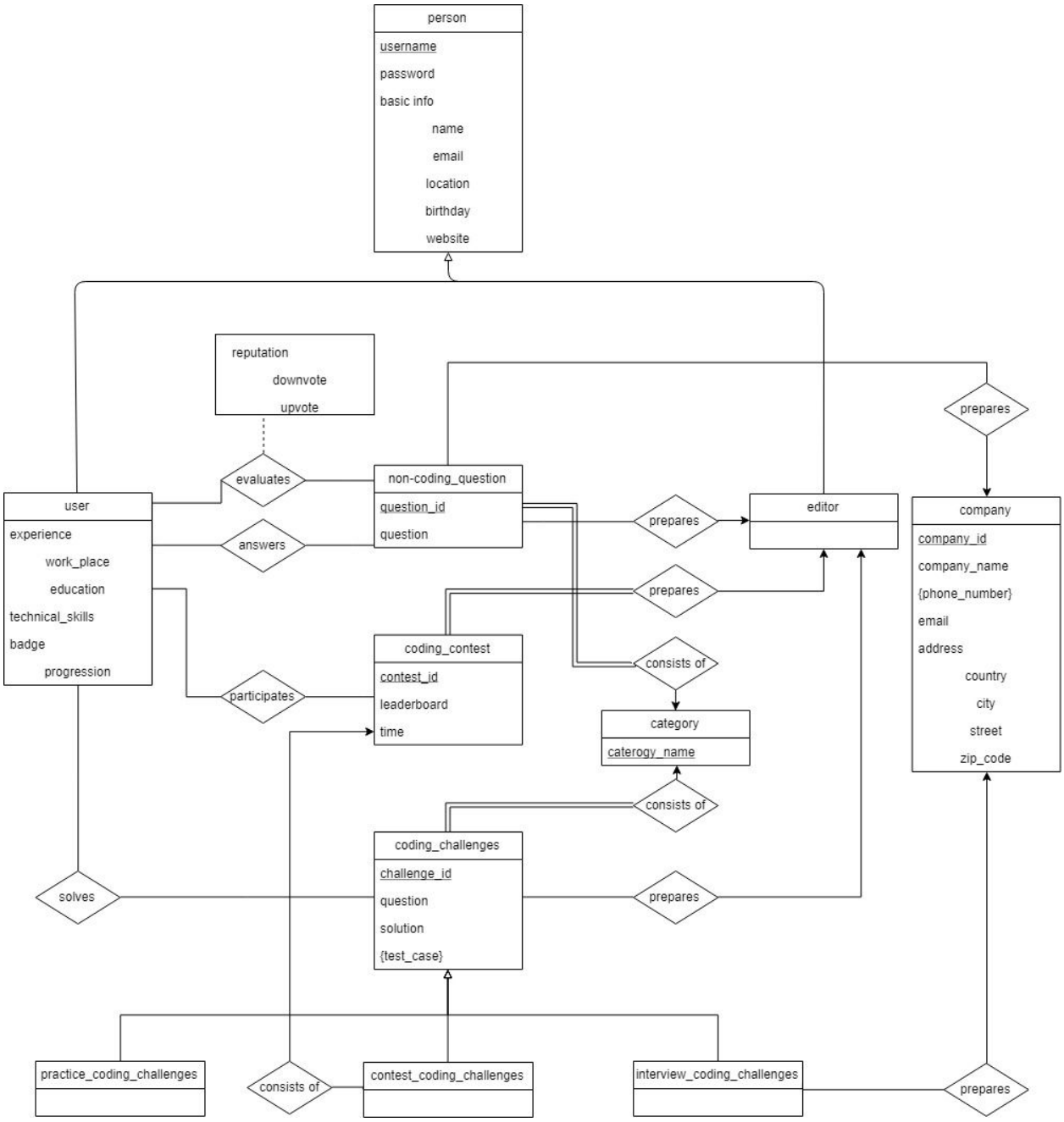
- The system will allow up to 2000 users to sign up to the system.
- The system should allow up to 200 users to use the system at the same time without any delays.

4.3 Limitations

- Only editors will be able to create coding contests.
- Only editors and companies will be able to create coding challenges and non-coding questions.
- Only users can access coding challenges, non-coding questions and coding contests.
- Coding contests consist of the questions that are not in the coding challenges.
- A user cannot upvote or downvote his/her own comment in the non-coding questions section.

5. Entity Relationship Diagram

The following is the conceptual design of this project. It was drawn using an online drawing tool [2].



References

[1] A. SILBERSCHATZ., H. Korth and S. Sudarshan, DATABASE SYSTEM CONCEPTS, 6th ed. [S.l.]: MCGRAW-HILL EDUCATION.

[2] “draw io”, draw.io. [Online]. Available: https://www.draw.io/. [Accessed 03 March 2019].