Bilkent University

Department of Computer Engineering

CS-353
Database Systems
Term Project

Proposal

Group 28

Project Group Members

Yusuf Ardahan Doğru	21803748
Efe Korkmazhan	21802712
Gülin Yılmaz	21903057
Zülal Nur Hıdıroğlu	21903125

Supervisor: Zülal Bingöl

1. Introduction

As a group, we will be designing an online library system called ZEGA library for our CS353 project. This report highlights the necessary components for the proposal of our project. The purpose of this report is to convey the necessary information to be able to conceptually understand the scope, abilities, and restrictions of the project.

The aim of this project is to build a database that is efficient, easy to understand, and use, with an intuitive front-end. The end product is expected to be an online library system where users will be capable of creating profiles, borrowing, reserving and returning books, registering into the system, and many more.

2. Description

The project will be a web-based application for managing a library and will be using a database of books, movies, multi-media rooms, and users. There will be three types of users: students, instructors, and the librarian. These users will have different features available for them and access rights for different types of actions in the library system. The main purpose of the platform is to allow the instructors to assign books or movies for students to read and watch, and the students to read and watch them. But apart from its main purpose, it will fulfil all the basic requirements of an online school library system, from borrowing and making reservations for books to having warnings to return the borrowed books and movies. The website will be hosted on the internet and the users of the website will be able to view the books and movies that are available for borrowing or holding, by browsing the books and movies by their title, genre, etc. The platform will require visitors to create an account, and the users will be able to create a new account with a username, department, and password. The librarian, which is the admin of the system, has access rights of a superuser in the database and therefore can access and edit all the other tables. So, the librarian holds the

responsibility of accepting and registering new users to the database. After the librarian registers these new users, they are given unique id numbers and added to the database of the system. Additionally, the librarian also handles the return and borrow requests for books and movies sent by the users, is able to register new books and movies to the systems, and issue warnings for the users to return their borrowed items. Users of the application will be able to hold or reserve three books and movies in total. They will also be able to view their borrowed, returned, on-hold, and assigned books and movies on their account. However, for students to use these functionalities, their warning count becomes significant. In the case that the librarian issues 2 warnings to a student, the student loses the privilege of holding or reserving a book. Their previous reservations still hold, however new reservations are not allowed. Additionally, if the librarian issues a total of 3 or more warnings for a user, the user loses the privilege of borrowing movies or books. Furthermore, after a student reads or watches an assigned book or movie, he/she must write a review about it. The reviews for the assigned homework are then viewed by the teacher, who accepts the homework as done if he/she finds it suitable. After the review is accepted by the teacher, at the student's account, the assigned homework is erased, meaning that the homework is done. Lastly, the multimedia room is able for usage only for users who borrowed movies, and only one user can use a multimedia room at a time. The multimedia room has the first-come-first-serve system, users do not need the librarians to approve the usage of the room. The only condition to use the room is to have borrowed at least one movie, and users who choose an available room first gains the right to use the room. There are 8 multimedia rooms that are uniquely identified by their room-id.

3. Requirements

3.1 Functional Requirements

3.1.1 Librarian

- The librarian should be able to accept or reject a user's borrow and return request.
- The librarian should inform the system about the borrowed and returned status of the books and movies, namely handling the borrow and return requests of the users.
- The librarian should be able to see the profiles of the users of the school library system. User profiles should display borrowed, returned, on hold, and assigned books.
- The librarian should be able to register new books to the system.
- The librarian should be able to add users to the system.
- The librarian should be able to send warnings to users.
- The librarian should be able to edit the information about books.

3.1.2 Users

- Users should be able to use the filtering options to browse the books in the library. The categories for the filtering system are title, author, genre, published year, duration, and director name. They can choose one or more categories and the system will show the options accordingly.
- The users can request to borrow and return the books.
- The users should be able to send a borrow request for a book if it is available.
- The users should receive notifications when their borrow or return request is accepted by librarians.
- The users should be able to enter and exit multi-media rooms.
- The users should be able to see the books they interacted with.

3.1.2.1 Students

- The students should be able to see their assigned books and the instructor who assigned them on their profile with that instructor's information.
- The students should receive notifications when an instructor assigns them a book.
- The students should be able to write reviews for the books that are assigned to them.
- The students should receive warning messages from the librarian about their borrowed books or movies and have their library privileges revoked according to their warning count.

3.1.2.2 Instructors

- Instructors should be able to assign some books to specific students as homework.
- Instructors should be able to read the reviews that the students write about their assigned books.

3.2 Nonfunctional Requirements

- **Portability:** The School Library Website should work on the latest versions of all browsers.
- **Usability:** We aim to keep the user interface handy yet as simple as possible to lessen the time it takes to learn the interface for the new users. Elements that most internet users are familiar with will be used. A manual for the user interface and the database will be provided.
- **Scalability:** The website can be used by all students in the University therefore to address the demand for large-scale data storage, the system should be scalable. The database should be capable of supporting many connections without failing.
- **Modifiability:** In our system, database tables are easily modifiable therefore new tables can be created, updated, or removed without affecting the rest of the code.

Moreover, the system is backward compatible which means that whenever the database is updated, it continues to support older versions.

- **Cost:** At the initial stage, the system does not need a huge budget for labor cost and maintenance costs since it is a small project. At that point, the general cost of the project does not exceed the limitation.
- **Recoverability and Disaster Recovery:** The database should be backed up to local storage regularly to avoid data loss in the case of a system breakdown. To achieve this, the stored information should be saved to another location on a regular basis.

3.3 Constraints

- MySQL will be for the database.
- PHP, CSS3, JavaScript, and HTML will be used for the website and server communication.

4. Limitations:

- All users have unique id numbers that will be provided to them by the system when the librarian registers the users.
- A user can hold or reserve a maximum of 3 items at the same time.
- In the case that a student receives 2 warnings, they will not be able to hold or reserve books or movies.
- In the case that a student receives 3 warnings, the student loses their privilege to use the system. In other words, they are unable to borrow or hold books. The maximum number of warnings that a student can have is 3.
- Only one student can use the multimedia room at once.
- A book can be borrowed only if its state is returned.
- An instructor can assign a maximum of 5 books to 1 student.
- Reviews of the assigned items cannot be longer than 1000 words.
- All the books are given the state “returned” when initially inserted into the system.

5. Conceptual Design of the Database using th E/R Model

The database we will use for the library system will have the following entities and relations with these distinct attributes. Figure 1 presents this in a clear manner.

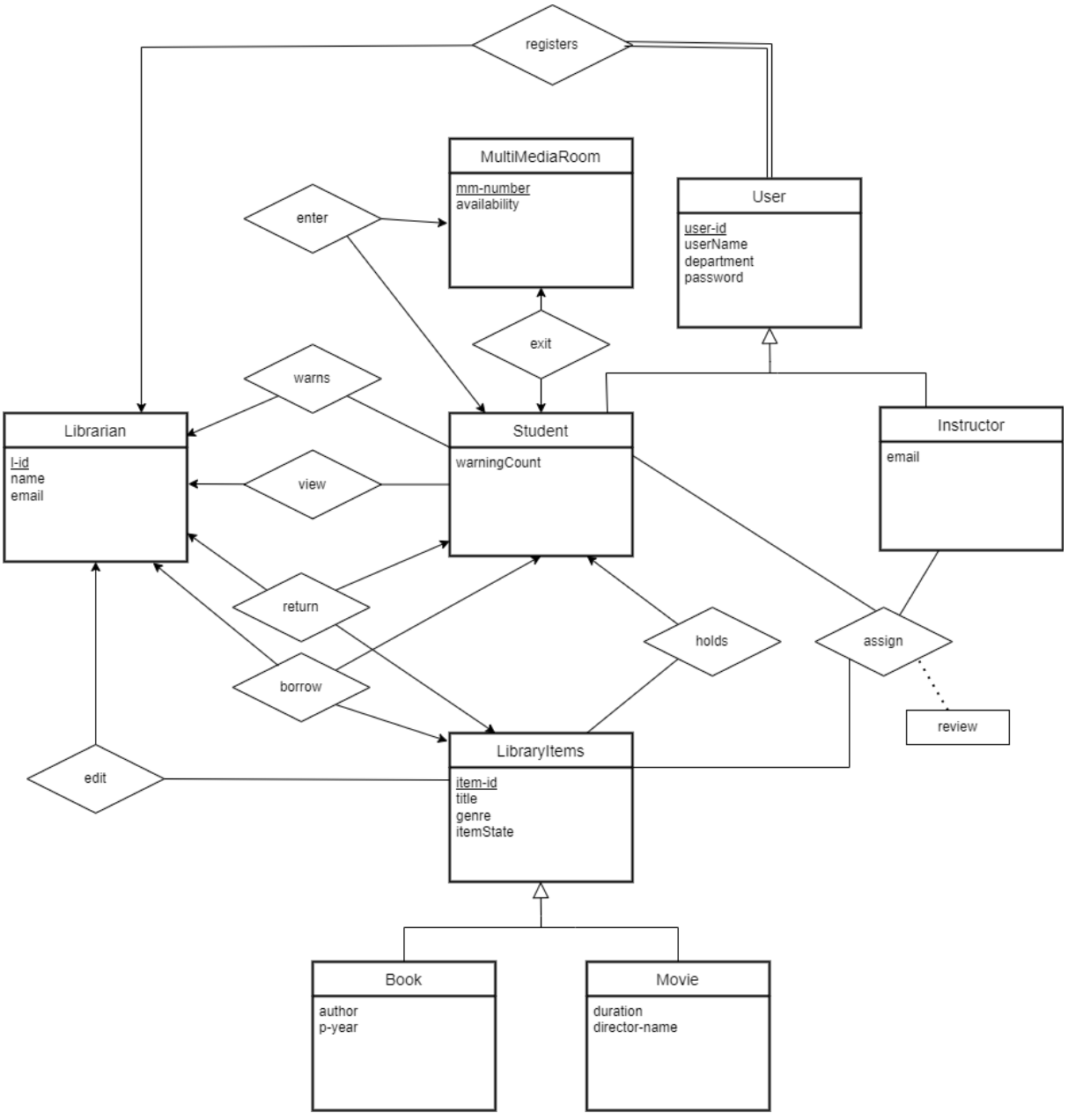

Figure 1: E/R Diagram for School Library Database System

Webpage

This is the link to our project webpage: https://efe-korkmazhan.github.io/