Bilkent University

Department of Computer Engineering

CS 353: DATABASE SYSTEMS

Group 3: Online Course Platform

Project Proposal

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Table of Contents

I. INTRODUCTION

In this report, the functionalities and scope of the Online Course Platform Database, as part of our project that revolves around this database, is explained. A Project Description will be followed by functional and non-functional requirements, then limitations and Entity/Relationship Diagram and its explanation, which will consequently be ended by a conclusion.

The description of the project discusses the "why" and "how" of the project, as in why we need a database structure for online courses, and how one can integrate databases into an online course structure.

After the description, in Requirements, functional, non-functional, and pseudo requirements are explained and discussed.

In Limitations, the disadvantages and the constraints for our database design are discussed. -- kursu kim editliyor, kimler content ekleyebiliyor vs

Finally, the Entity/Relation Diagram will serve as the basis for our conceptual database design.

II. PROJECT DESCRIPTION

Before the pandemics hit the world with the requirement of staying indoors, the private courses held by various independent instructors were mostly conducted face-to-face, and the notion of online courses, while still available, was not as widespread as it is now. The topics for these courses varied from topics discussed in schools to hobbies or languages. The inclusion that this period has required us made the world realize that online courses are a great alternative to face-to-face courses, and there are many ways that they could even be better than them. We are aware of the limitations of an online course system, namely the lack of interaction either between the teacher and the student or the interaction between students in the way it would happen in a course conducted in a class.

The Online Course Database system is a system that is designed to be used in the form of a web-based application that is to be used primarily by teachers and learning enthusiasts as well as companies wishing to create courses on the site and teachers, with advertisers being the secondary users. The employees of a company or students of a teacher will be able to use the application through the added feature of course code, that is while some courses will be searchable and applicable to everyone, some will be private and will be enrolled into only through their codes if the course creator wants to. Our primary aim is to make the teaching experience as close to real-life private courses through additions of Q&A's with teachers and a forum for each course to be used by the enrollees of each course, as well as the

inclusion of note-taking for each course content, while benefiting from the advantages of online education such as self-paced learning and more mobility to teachers and students. The database includes information about each user (their username, real name, email address, and password), the courses they teach as well as the courses they are enrolled in, their instructor description if they are teaching a course, the information about the courses (its name, price, whether it is private or public), information on discounts applied to the courses if there is any (its new price, a start and end date for the discount), and information for each lecture of the course as well (its unique lecture no as well as name, video, and subtitle) and each lecture material, if there is any. The student's enrollment, progress on the course, their rating on the course, whether they finished a course (through an information of certificate), if the course is on their wished list, and their notes if they have taken any will also be held in the database. For the Q&A's of the course, each question and its answer provided by the instructor will be held in the dataset along with their unique identification numbers. Social security numbers, names, addresses, phone numbers and emails of admins will be stored in the dataset as well alongside the information on content managers and advertisers. Using this database system, the learning enthusiasts can modify their profile, search for the courses they are interested in, and interact with the courses they are enrolled in by watching its videos, interacting with the documents attached to the course, and communicate with the course manager as well as other enrollees through the forums, Q&A pages, and discussions in each course. The users can also form courses for which they are the teachers, and the teachers can form and modify the contents of the course, change the cost of the course, conduct a sale for the course for a limited time period of their choice, be informed of the website-wide sales and choose to be involved in the sale, and communicate with the enrollees of their courses through the discussion pages.

Our aim is to create an online, web-based application for the purposes of an online course structure, akin to the likes of Udemy, Udacity, Skillshare, and so on, with the addition of features to make the teaching experience more interactive. The platform that we form will not only be used as a teaching platform, but it will be a platform where the contents of the platform are not limited to any medium, i.e. video, audio, pdf notes, and where the contents of each study could be discussed extensively by the users of the content by the forums we establish as a part of the application. One other way we want to make the notion of online teaching more interactive and akin to face to face teaching is through the addition of note-taking for each course content. We also want to make the information that is meant to be public for each user and course readily available, accessible, and searchable.

A. Why Do We Need This Database?

An online course structure requires the holding of possibly very large numbers of data - the information of users, the information of courses and of

each user enrolled in the course, and such. As such, the problem of storing large amounts of data in the most efficient way is a problem that could be solved by the use of database structures. In addition, the addition to and deletion of data is made easier as well as the speed at which one can search and find a specific data is incremented by the use of databases. Furthermore, we need the database to be accessible by multiple sources, which is one other benefit of the usage of databases.

B. How Do We Use This Database?

The use of a database will make it so that while the information of users and course contents will be held and stored, searching through them and finding lengthy information on a specific content will be easier; thus, solving the problem of storing and efficient search.

III. REQUIREMENTS

A. Functional Requirements

The Online Course Platform Database System supports 5 main end-user types which are Instructor, Student, Administrator, Content Manager, Advertiser. All types of users should be authenticated to be able to use the particular functionalities.

Instructor
- Instructors should be able to request for adding new courses.
- Instructors should be able to change the cost of their courses or apply/allow discounts or sales on the course for a particular time.
- Instructors will be able to change the visibility of their courses (private or public).
- Instructors should be able to publish documents related to their lectures.
- Instructors should be able to answer questions on the Q&A section of the course.
- Instructors should be able to add new lectures to an existing course.
- Instructors should be able to approve/reject requests for advertisement for their courses.
- Instructors should be able to make announcements for a particular course.
- Instructors will be able to give his/her courses to the students for free by providing their emails.

Student
- Students should be able to select their areas of interests such as biology, software, painting etc.

- Students should be able to get notifications about the new courses related to their areas of interests.
- Students should be able to view the instructor profiles and courses given by the instructors.
- Students should be able to search for a particular course.
- Students should be able to track their progress on courses.
- Students should be able to rate courses after finishing it.
- Students should be able to get a certificate after completing all the lectures of the course.
- Students should be able to add courses to their wishlist.
- Students should be able to request a refund on bought courses with a valid reason.
- Students should be able to purchase a particular course for themselves or as a gift by entering the email of another student.
- Students should be able to take notes to the provided notebook part for each course.
- Students should be able to ask course related questions on the Q&A section of the course.
- Students should be able to get notifications about the course they have.

Advertiser
- Advertisers should be able to request for sharing their advertisements and the money they will pay for it.
- Advertisers should be able to apply to instructors to advertise in their courses.

Site Admin
- Site Admins will be able to see the applications of people who want to become an instructor and be able to approve or reject their application.
- Site Admins will see the applications of people who want to become an advertiser and be able to approve or reject their application.
- Site Admins will be able to see the complaints about the courses and reply to them.
- Site Admins should be able to approve or reject return requests of users.
- Site Admins will be able to offer discounts on courses whose creators allow.
- Site Admins should be able to approve/reject the requests of instructors for adding new courses to the system.
- Site Admins should be able to approve/reject the requests of advertisers for adding new advertisements to the system.

System Requirements
- The system should be able to update the price of the courses according to the discount days.

B. Non-Functional Requirements

Security
- All courses and advertisements must pass the approval of the site admin before it is published. Site admins secure the safe context of the site.
- To be an instructor, one must have the approval of the administrators for the request of being an instructor. Administrators secure the legibility of the instructors.
- Each course can be accessed by the unique code differently given to each user that buys. The course can be used by only one user, ensuring that people who did not buy the course cannot access it. The rights of creators and students are protected.
- The stored data of the users will only be shown to them, ensuring their privacy regards to the sensitive data protection.

User-Friendliness
- The course platform should have a clear, understandable, and easy user interface so that users can easily benefit from the options that site offers. The search engine will be accessible at any time from the top of the site, making it easy to change the screen to the subject of interest. Students can track their progress on admitted courses via the screen presenting every ongoing course with their completeness score. The option of taking note, making a complaint or asking a question will be a click away during the lecture for a comfortable usage.

Performance + Response Time
- The response time of the site admin for the approval/rejection of the advertisement request, instructor application, or course publication changes from 1 day to 1 week due to the consideration process runned by a human.
- The performance of the system is dependent on the database. As time passes, more and more people, courses, and relations will be added to the database, causing a rapid growth. The enhanced database takes longer response time due to the process time and waiting time. However, proper indexing helps to the problem, keeping the response time at minimum which will be implemented in this course platform.

Capacity + Maintainability

- Priorly, the system will have a database with a medium capacity, enough for the near future predictions. With the growing number of users and relations, the storage capacity of the database will be not enough at one point. In order to maintain the system functioning and running smoothly, the capacity of the database can be updated.

Physical Environment + Hardware Considerations

- The course platform will be online, allowing students to interact with instructors via the computers on both sides. The computers do not have to include extreme qualifications but an internet connection; since, the course platform is online.
- The aim of the course platform is to avoid physical interaction as much as possible while gathering a group of students for a lecture. Both the student and the instructor will have the physical requirement of having a computer with a working mouse. If the student does not prefer to use a screen keypad; then, a keypad to use the search engine, ask questions, and take notes may be necessary.
- In addition to the restraints that students deal with, instructors will upload their courses in the video format which requires visuality and sound.

Documentation

- The reports written such as this one will give a better understanding to the client about the product so that the differences on implementation and demands can be solved beforehand.

Error Handling + Reliability

- There are many possible errors awaiting with the database running. In addition to possible problems due to the server or hardware that we stated at 3.2.4 and 3.2.5 which also includes the handling of these problems, one of the most common problems with the database system is the error of joining tables. To prevent such issues, we will apply straight engineering by composing the tables and relations beforehand the implementation so that any possibility of accessing a joined table that is not joined in the database is avoided. Moreover, there is always the possibility of errors and exceptions outside of the database part of the code; thus, exception catching mechanisms will be used.

Quality Issues
● The reference given in the document of topic announcement for an online course program is Udemy. We will try to implement the good features of online course platforms such as Udemy or Coursera and also improve the problems and weaknesses of those platforms. The improvements will be implemented based on the online learning experience that we are having for a year.

System Modifications
● Our platform does not require any modification on a computer that is functioning with a mouse / touchpad and has internet connection. Instructors may need a working camera and microphone as well since they will record their lectures.

C. Pseudo Requirements (Constraints)
● Project will be a web-based application including the end-user and administrative interfaces.
● MySQL will be used from the recommended DBM systems.

IV. LIMITATIONS
● Instructors cannot accept advertisement requests for their course if it is not approved by the site admin. It will be in pending until the approval or the rejection of the site admin is submitted.
● Contributor instructors cannot change the price of the course.
● Students cannot answer questions in the Q & A section.
● A particular email can be used to register once for each type of end user. For example, an instructor might also have a student account with the same email address.
● Students cannot purchase a particular course for many times for their accounts. If the course is already purchased, they can only buy the course as a gift by providing another account's email.
● Students can request a refund in 5 days.
● Students cannot see or access a private course unless it is gifted to them.
● A course cannot be sent as a gift to a student who has already purchased the course.
● Instructors cannot buy their own courses but can send them as a gift for free.

V. ENTITY RELATIONSHIP DIAGRAM

VI. CONCLUSION
The Online Course Platform Database System is a web-based application for managing the release and purchase process for online

courses. Its user base consists of instructors, students, advertisers and site admins and the system is designed to . The system shows…..

In this report, we explained our aim and the scope and functionality of our database design followed by an explanation of our reasons for incorporating a database management system (DMBS) for the project. The report follows the description with functional, non-functional, and pseudo requirements, where we defined the requirements needed for each user, and limitations where we clarify boundaries of control for each user.

The last part of the report is an Entity/Relationship Diagram where the database system is represented visually.

VII.   WEBSITE

https://ivorymask.github.io/