1. Abstract

Nowadays online learning has steadily become popular, compared to traditional education it has some advantages and revolutionizes formal education. Online course is designed as a built environment for studying. It's constructed as an experience that can be followed sequentially and can be accessed throughout the whole designed period. Trainly.io is an App store used to serve the field of all kinds of training and now begins to design an online learning application for more students. Our project is to help achieving the goal that organizations constituted by faculty can create courses and securely post study materials, students can enroll in and complete useful courses they interested, and Trainly.io only charges 30% of any course-enrollment fees. To fulfil this, our group firstly designed the ER (Entity Relation) diagram according to provided narrative statements and all kinds of requirements. Then we normalized all entities and relations of the diagram to satisfy 3NF restriction. At next stage, we achieved physical design which is including justification of any included indexes and denormalization. After the database design finished, we also implemented sample DDL and DML program for SQL tests and required tasks to ensure the whole design for application work fine. In the following report, there will be the test results.

Keywords: DDL, DML, ERDs, normalization, online training, physical design, SQL, Trainly.io

2. description

We are designing a Database application for Trainly.io which is a startup disrupting the training industry. The Trainly.io is an App Store of training where organizations with faculty can create and teach courses for users who find and enroll in.

First of all, our database application implements User Management entity. Each user has a name composed of first name and last name, a unique email address which can identify each user, a password for account, a personal profile picture, multiple contact phone numbers, and a contact address included information of street, city, postal code, and country. A user is default to be student and it can be one or more roles of faculty, and administrator.

Faculty are the creators of courses, and must be verified by an administrator and recorded by the date/time of verification. A faculty has own title, affiliation, and work website.

Administrators have a variety of enhanced positions within the system, and must be granted roles by another administrator. When they are granted, the date/time must be recorded.

Each course has a name, description, icon, cost, creation date, and a course ID (CID) that can identify itself. Each course also has a primary topic and many number of secondary topics. A course must be created by at least one faculty member, and a faculty can create as many courses as they want to. Students have a list of courses that they are interested, and can enroll in any courses whether they are indicated as interest or not. When students enroll in those courses, the system must correspondingly record their date/time of payment and payment confirmation code. If a student completes a course, the date/time of completion must be recorded. Additionally, they are asked to provide a rating, as well as any comments they might have for the course.

Each course contains a list of materials to be completed by students. Each course material has a name, and a unique course material ID. A piece of material can be either a downloadable file, a link, a post, or a quiz. Each downloadable file has a path, size, and type. A link has a URL and tagged video. A post just has a large block of text. Each quiz has a minimum passing score and a sequence of questions composed of numbers, text, and sets of answers. Each answer is made of a feedback and an indication of correct or wrong.

Then we implement an entity named Course Questions. Each question has a title, a text, a unique question ID (QID) to identify itself, and whether visible to others or not. Students enrolled in the course can submit any questions. Those questions may be related to some of the course materials and faculty will answer the questions with blocks of text. Other students can indicate “like” to questions and the rating can be counted to inform the ranking of questions on the course site.

We also implement a playlist entity. Each user can create any number of playlists, and the name of each playlist is unique to individual user. A playlist is comprised by a sequence of enrolled course materials.