Governors State University

OPUS Open Portal to University Scholarship

Fall 2021

eLearning

Ajay Naik Banavat

eLearning

By

Ajay Naik Banavath

B.TECH., JNTUH University, 2016

GRADUATE CAPSTONE SEMINAR PROJECT

Submitted in partial fulfillment of the requirements

For the Degree of Master of Science,

With a Major in Computer Science

Governors State University
University Park, IL 60484

2021

ABSTRACT

E-Learning Management System is one of the best systems for learning. During covid-19 period all students and teachers had struggled to face teach / learn. Purpose of eLearning is the easiest way to learn or instruct from our convenient place. Maybe if the instructor / learner do not have time at that particular time they are advising / learning leisure time. Instructor / Learner can teach / learn from one country to another. Anyone can learn / instruct from anywhere using this Management system. It's not necessary to teach them from on-site / online. If the instructor records the flow and uploads their course materials, they will see and learn everything.

This application has three roles one is an Instructor, Learner and Admin. Instructors who upload the course material / content for the learner's study material. Admin can manage everything like instructors, users, categories, plan details. Learner can register their account, raise the doubts using forum and will receive the notifications from admin/instructors.

To build the application handling the above features, we are using the logic for .NET Core on Visual studio. Besides, we are using the web technologies like HTML5, CSS3, Bootstrap, Ajax, Asp.net, and jQuery to develop and support the application, and for the database, MSSQL will be used.

Table of Content

1   Project Description

An "e-learning management system" has been developed to address issues in the manual system. This software supports the elimination and in some cases the difficulties encountered by this existing system. Furthermore, this system is designed for the specific need to carry out the activities of the company in a consistent and effective manner. When inaccurate data is entered, the e-learning management system displays an error notice. To avoid errors when entering data, usage should be minimized as much as possible. This system does not need any prior knowledge on the part of the user. Through this it has proven to be user friendly. The e-learning management system will lead to a flawless, secure, reliable and fast management system as described above. As a result, the organisation will be able to make better use of its resources. Each e-learning management system has different requirements; so we design specialized course management systems to suit your management needs. It is designed to assist in strategic planning with the right amount of information and details for your future goals.

1.1   Competitive Information

We have designed e-learning based on online forms that allow teachers to easily organize classroom competitions. This system is used in elementary research to assess whether or not cooperative competition is positive in education, and such activity can help students identify traits that are not harmful and motivate them in their learning process.

1.2   Relationship to Other Applications/Projects

Our website is associated with the eLearning Progress System. It helps the instructor achieve their goals and is also encouraged through self-study practices. It provides access to exclusive, rich and updated content and accessibility is open, secure and unrestricted. E-learning helps you sync with modern learners and keep up with current trends. Instructors have a variety of options to teach from such as you can create recorded lessons and sell courses with packages. Therefore, there are many opportunities to earn side income or regular income.

1.3   Assumptions and Dependencies

- This website will be very valuable in providing good learning results, which is a critical function of e-learning.
- ELearning websites have grown in popularity around the world, providing learners with a rewarding profession.
- This website plays an important role in the communication between the learner and the instructor

1.4   Future Enhancements

The eLearning website aims to replace the traditional education system with a modern education system through the use of cutting-edge educational technologies. The growing popularity of big data and learning analytics, as well as the rise of cloud computing, are important trends that are altering the face of the online education sector. For technical assistance, educational institutions in the country are transitioning to SaaS-based solutions such as ERP and eLearning provided by cloud service providers. The eLearning websites are collaborating effectively with the government and educational boards to spread the cloud platform. Furthermore, adopting learning analytics or big data analytics is assisting online course providers in designing custom-made courses, ensuring learner self-regulation, and making learning progress accessible to students. As a result, the evolution and growing awareness of new technologies will increase market adoption of eLearning, thereby driving growth in the online education market.

1.5   Definitions and Acronyms

- ❖ HTML5 is Hypertext Markup Language 5
- ❖ CSS3 is Cascading Style Sheet
- ❖ SaaS is Software as a Service
- ❖ Microsoft's New Web Framework is .NET Core. The framework you want to use for.NET web development is.NET Core.
- ❖ Net is Network Enabled Technology
- ❖ MVC is Model –View – Controller
- ❖ AJAX is Asynchronous JavaScript and XML.
- ❖ XML is eXtensible Markup Language
- ❖ JSON is JavaScript Object Notation

2   Project Technical Description

Technically, this project serves as a learning platform. This project was built using .Net Core MVC features like Entity Framework and bootstrap to design the user interface, HTTP sessions to save user data, LINQ to access database objects, and so on. We request the JSON value from a remote server using both HTTP Get and HTTP Post - and then load the external data directly into the HTML elements of our web page -

using the jQuery AJAX methods. In this application, we used four controllers. For example, Home, Administrator, Instructor, and Learner. The repository was used to make the coding process easier.

2.1 Application Architecture

We utilized the EF migrations functionality in this application to alter the data model and update the database schema without having to dump and recreate the database. In this project consists of three modules Admin, Instructor and Learner to make the architecture complete. To begin the application, I will describe the guest page before the roles. In this guest page everyone see the course and category, forum in the application without signing in. This application's initial role is Admin. Admin only can able to create a category, plan, manage the users and course details. The second role of this application is the Instructor. Instructor must purchase the plan subscription to add the courses and it related information. The instructor can only create the course, course content, course material, discussion forum, monitor student progress, and send notifications. The third role of this application is the Learner. Learners can add courses to their favourites list, buy them using the add cart, and submit their questions to the discussion forum, as well as view their payment history and update their profile and password. We used two layouts in this application, one is main layout it displays for guest and everyone and the other is login layout, depending on whose login it is. In the login layout, we utilized the dashboard, which informs the data based on the login function, such as admin, instructor, or learner.

2.2 Application Information flows

We used three different streams to come up with a website regarding the course. The application workflow is shown below. The information flow is the main workflow of the whole application. The guest can have to lead the home page. Then they lead to the registration process. After the registration, they will go to the login page. After login, the learner, instructor and the admin can able to access the home page where they can search for the course. Can be created or viewed or purchased the course with different options by logging in as an administrator or instructor or learner. At the end of the process, all the users have to successfully log out of the website to keep secure their information.
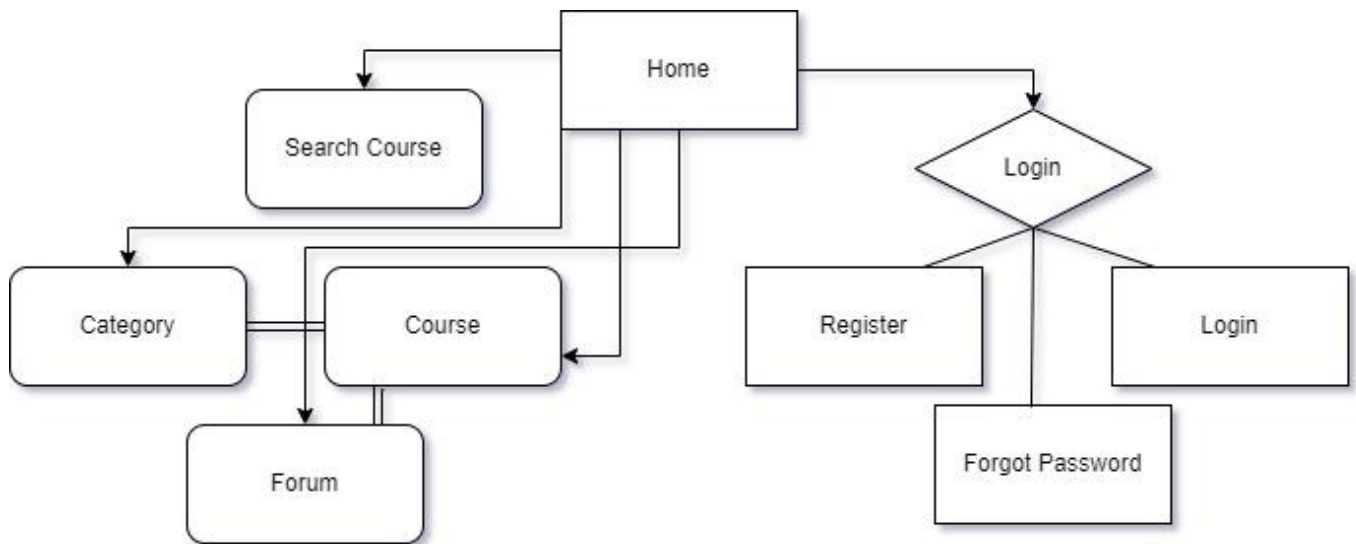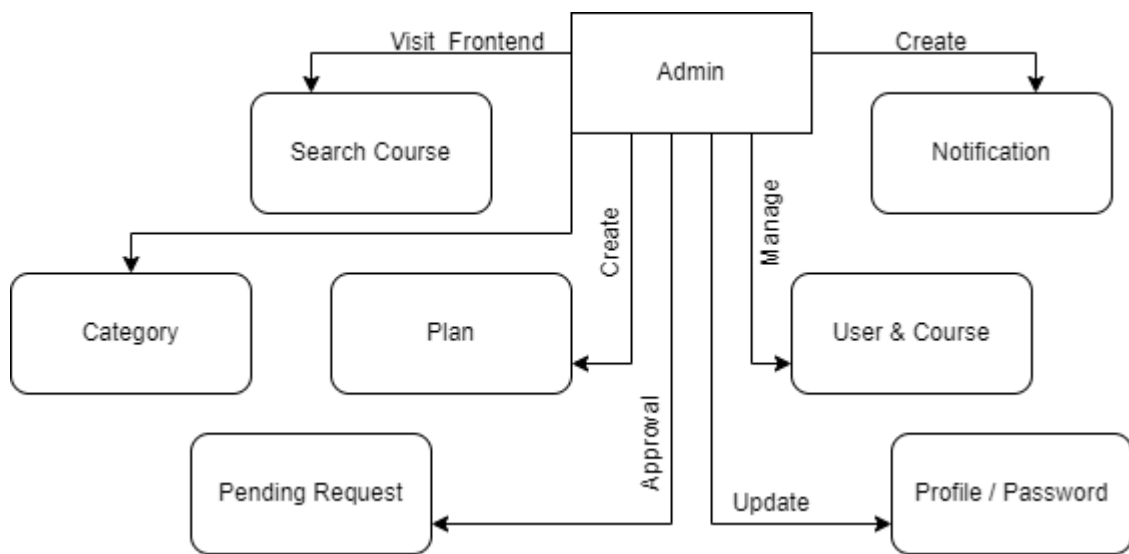
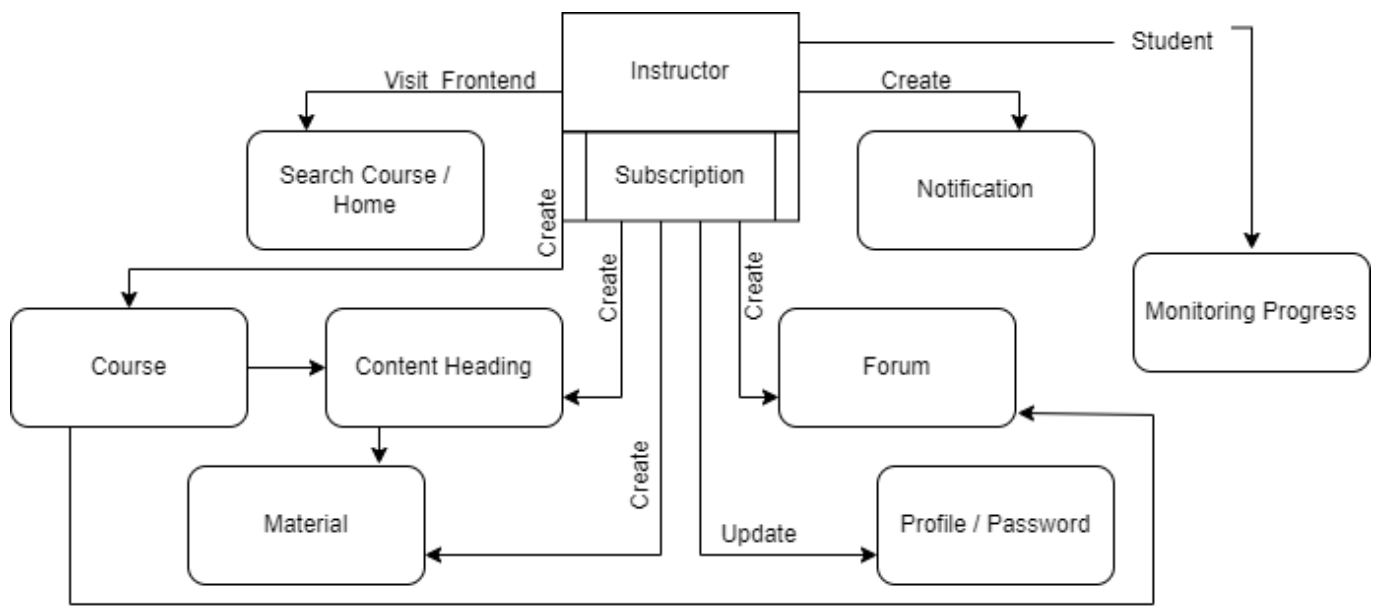**Figure 1: Guest Page Workflow Diagram**

Figure 2: Admin Workflow Diagram
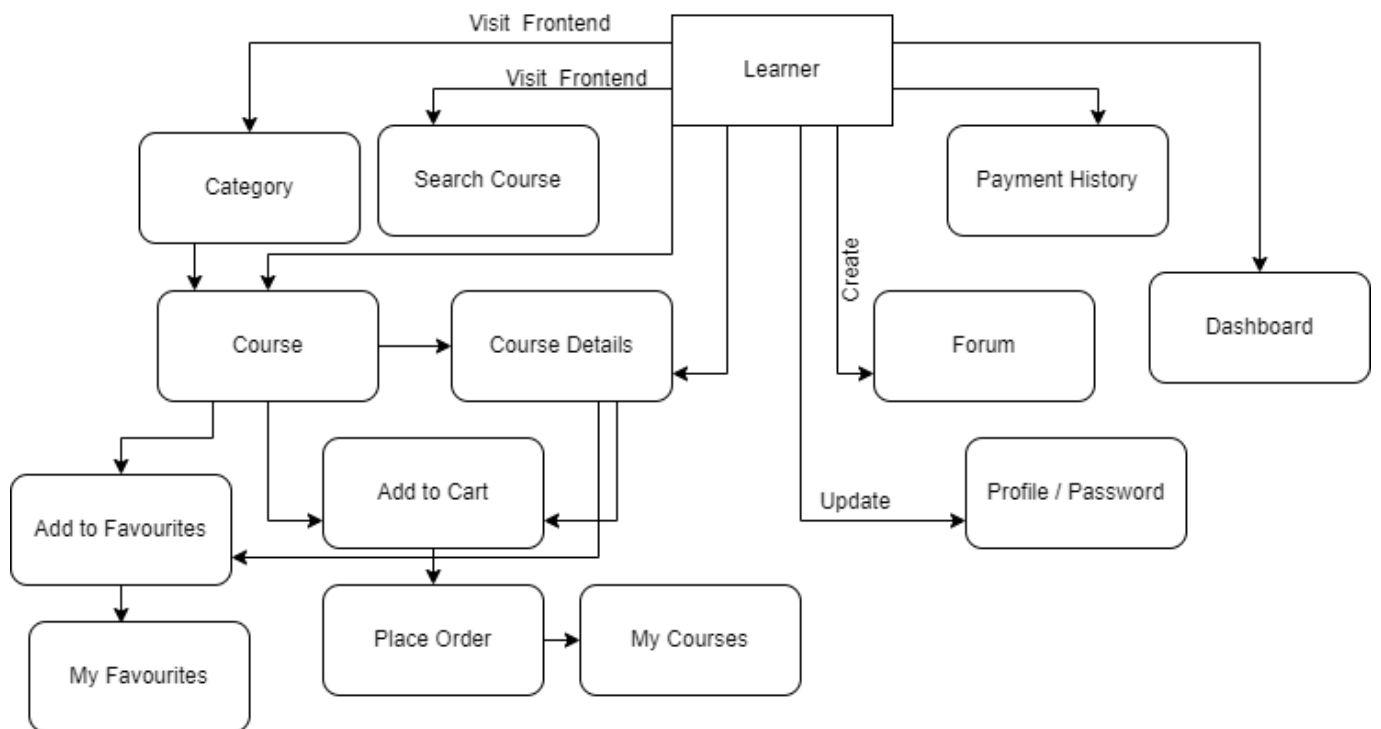
Figure 3: Instructor Workflow Diagram

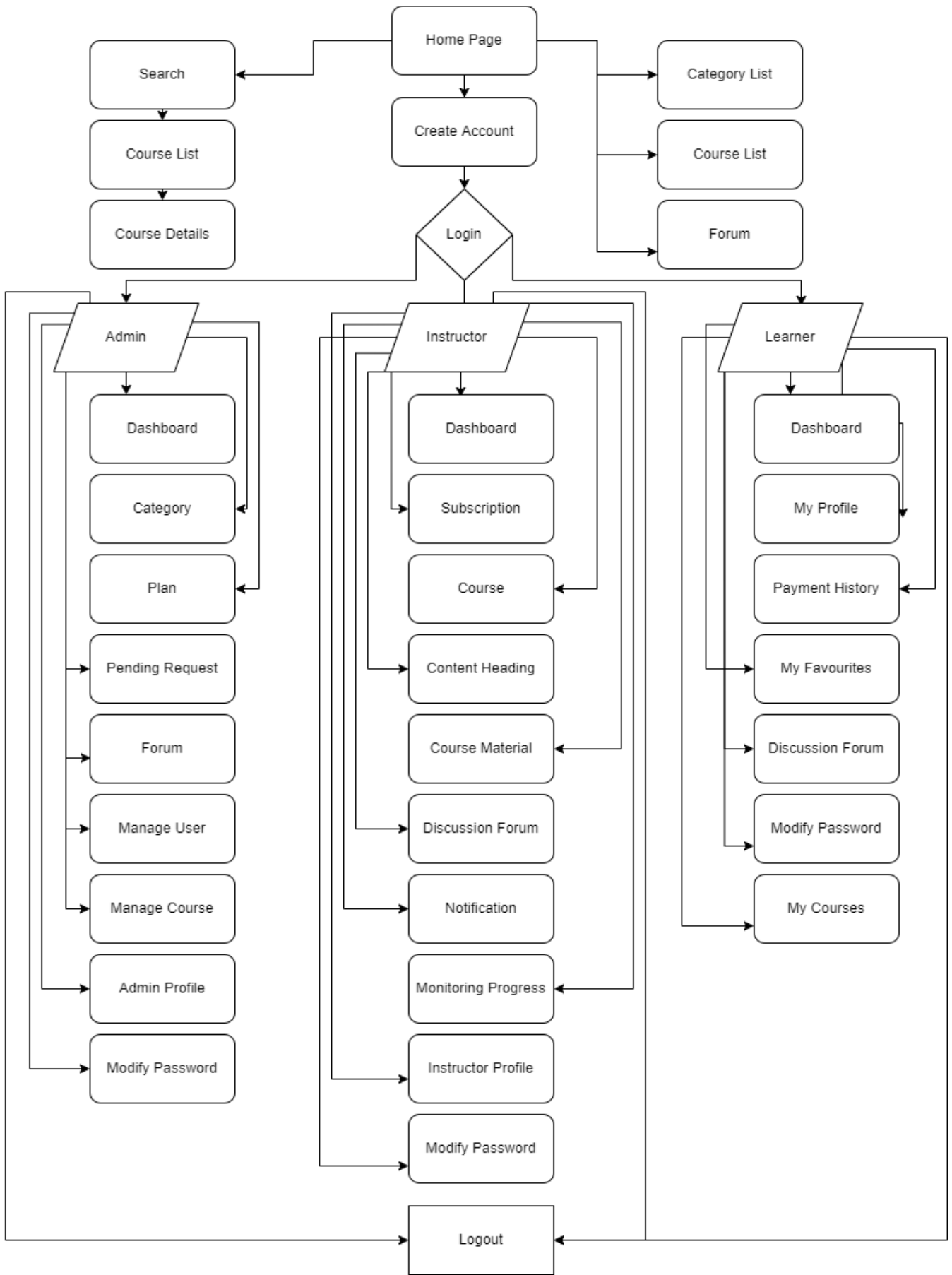**Figure 4: Learner Workflow Diagram**

Figure 5: Application Architecture

2.3 Interactions with other Projects (if Any)

2.4 Interactions with other Applications

Our application provides a hybrid e-learning platform that provides highly powerful and cost-effective learning solutions with access to self-contained, work-based content. Through this integrated product offering, companies can extend the power of their eLearning solution by incorporating business content encoding capabilities for easy retrieval of learning content and personalized eLearning plans.

2.5 Capabilities

✓ The users should be able to access this application from whatever type of device they choose, whether it's a desktop, laptop, tablet or smartphone.

✓ Users should be able to use this application from any device they desire, including a desktop, laptop, tablet, or smartphone.

✓ Instructors must be able to view and monitoring the learner progress.

✓ Course and material management - This application holds all the eLearning courses and the related course content. Instructor must be on valid subscriptions then be able to create and manage these materials and courses to provide a more targeted learning experience

2.6 Risk Assessment and Management

Risk management is becoming the most challenging aspect of eLearning projects. While we can never forecast the future with confidence, we can use a simple and efficient risk management method to anticipate the application's uncertainties and reduce their incidence or effect. Risk management assists not only in avoiding crisis situations, but also in remembering and learning from previous mistakes. This increases the likelihood of a successful project completion while minimizing the consequences of those risks. We're still a long way from having an acceptable risk management system in place. It is a continuous learning process to be able to constantly improve our practices in order to increase the efficiency of our processes.

3 Project Requirements

3.1 Identification of Requirements

<ELearning-eLearning_2021-1 User-capability-"000101"> Responsive Design: Users may be certain of receiving the best possible user experience on any platform, including desktop, laptop, tablet, and mobile.

<ELearning-eLearning_2021-2 User-capability-"000102"> Payment & Subscription: The instructor and learner must have a secure transaction for purchase the plan / courses.

<ELearning-eLearning_2021-3 User-capability-"000103"> Admin Console: The administrator may manage users and courses, as well as create, amend, and remove categories and plans.

<ELearning-eLearning_2021-4 User-capability-"000104"> **Instructor Console:** The instructor can add the content of the courses, monitoring the student progress and clarified the queries using discussion forum.

<ELearning-eLearning_2021-5 User-capability-"000105"> **Learner Console:** To gain access the learning materials, the student must first purchase the course.

< ELearning-eLearning_2021-6 User-capability-"000106"> **Registration:** The registration process is essential for all users, such as administrator, learner and instructor.

3.2 Operations, Administration, Maintenance and Provisioning (OAM&P)

Operations

- ➢ This application is intended to assist you in learning a course at your leisure.
- ➢ This application is simple to use and dependable.
- ➢ The website's function for purchasing courses should be simple and secure.
- ➢ Registration and logging in are not required to use the website.
- ➢ The results of the search option should be included in those courses.
- ➢ Using the main page, this application allows all registered users to access secure transactions.

Administration

- ➢ Only the administrator has access to all users and course materials.
- ➢ Only the administrator has the ability to create, modify, and delete categories and plans.
- ➢ After being approved by admin, the user may be granted access to the forum's information.
- ➢ The administrator has access to all of the information in the dashboard.

Maintenance

- ➢ Pages load faster when large file sizes are removed from complex web applications
- ➢ This utility ensures that the regular backup includes the entire website and data.

Provisioning

- ➢ This application ensures reliable configuration.
- ➢ The ability to monitor user progress and performance.
- ➢ Instructor can have the ability to update modules and functions easily and efficiently.

3.3 Security and Fraud Prevention

The security and fraud detection process can be established through security planning and fraud prevention planning. The following steps are the fraud prevention planning process

- ➢ Delegated responsibilities with specific role to the management and instructors
- ➢ Real-time alerts and notifications that bring potential fraud cases to your attention.
- ➢ The application should be updated on a regular basis.
- ➢ All user details should be saved through the required registration process.

3.4 Release and Transition Plan

Before website development can begin, the site must be finished and fully tested. The website should be launched for eLearning process before fixing the bugs. After booting, the data storage process will be activated and the maintenance process will be used to maintain the continuous workflow of the application.

4 Project Design Description

This website is primarily designed for eLearning purposes. We used Udemy and Coursera as examples of reference websites. We added several pages to this workflow and used two layouts for this application. The first is the Main Layout, and the second is the User Layout. The primary goal of the layout is to display all types of information about courses, with or without a registration process. If the user forgets their password, we simply reset it with their valid username. For all types of users, we used a single registration. The categories, courses, and course details pages are accessible to all types of users. If the user purchased the course, they will be able to see the material information; otherwise, they will only be able to see how many contents and materials are included in their course. The course can be saved to user favourites list as well as their cart.

When a user logs in as an administrator, the page that appears is the Admin Layout Page. The administrator can see all of the information related to this application in the Dashboard using this Admin Layout. Only the administrator has the ability to create categories, plan and manage instructors, learners, and courses. The only authority granted to the administrator is the ability to approve the discussion forum. In their layout page, administrators can change their password and update their profile information. This notification bell icon only displays the number of notifications and the details that the user has not yet seen. To display the notification and alert, we used the Ajax function.

When a user logs in as an Instructor, they are taken directly to the Instructor Layout Page. The instructor will only be notified that the subscription has expired. Only the learner, notification, courses, and forum are displayed in the instructor dashboard [the courses and forum were created by the current user]. Only up to a valid subscription, the instructor has the sole right to create / modify the course, content title, course material, and forum. The notification is also sent to other instructors and learners by the instructor. Only the instructor has access to the student's learning progress. Instructors can also change their passwords and profiles.

When a Learner logs in, they are directed to the Learner Layout page. On the dashboard, learners can view their own information, such as how much they spent on learning, how many courses they purchased, how many notifications they received, and how many responses they sent to forums. Learners can view their favourite courses as well as their payment history. The layout page also allows the learner to change their

password and profile information. The user layout design process is mentioned in the preceding information.

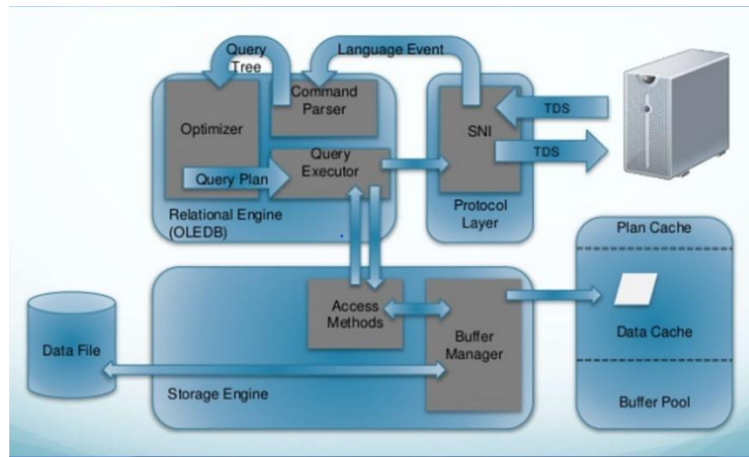## 5   *Internal/external Interface Impacts and Specification*

Figure 6: MSSQL Database

Figure 7: Software Development Life Cycle of this application

Application Design Features includes the following screen shots:

Figure 8: Home Page

Figure 9: Categories Page

Register Here

First Name

Last Name

City

State

User Name

New Password

Confirm password
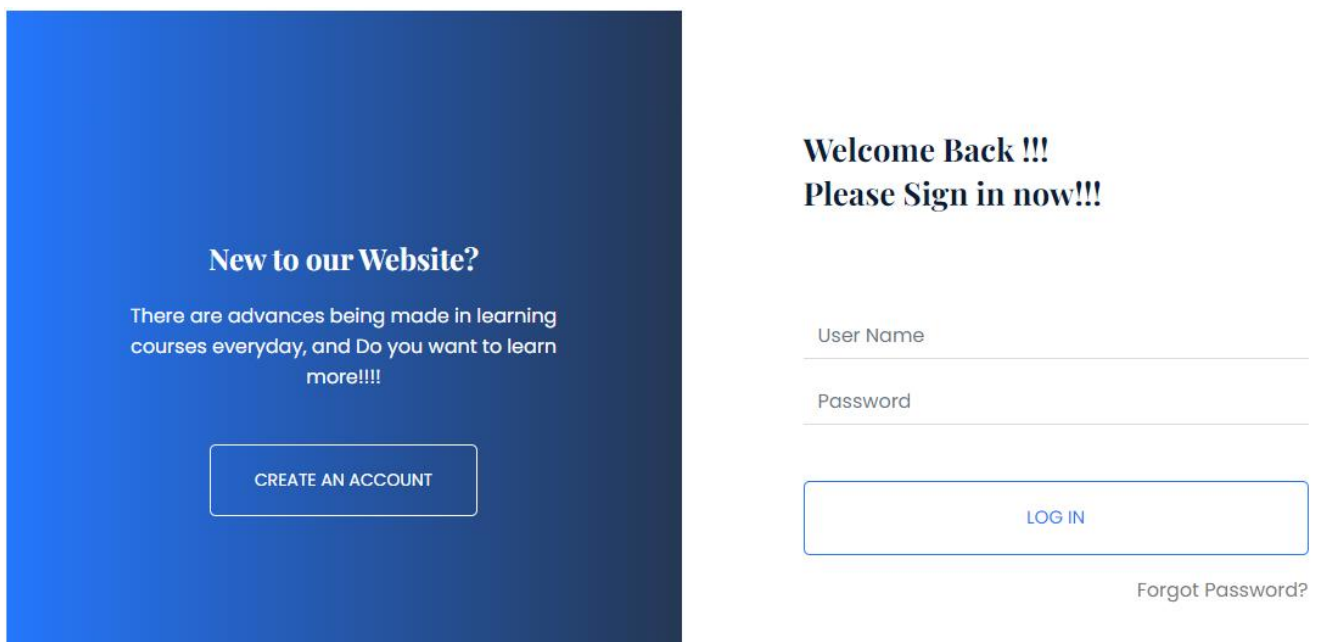
Mobile Number

Email Address

User Type   Select User Type ∨

About

Figure 10: Registration Process of this Application

New to our Website?

There are advances being made in learning courses everyday, and Do you want to learn more!!!!

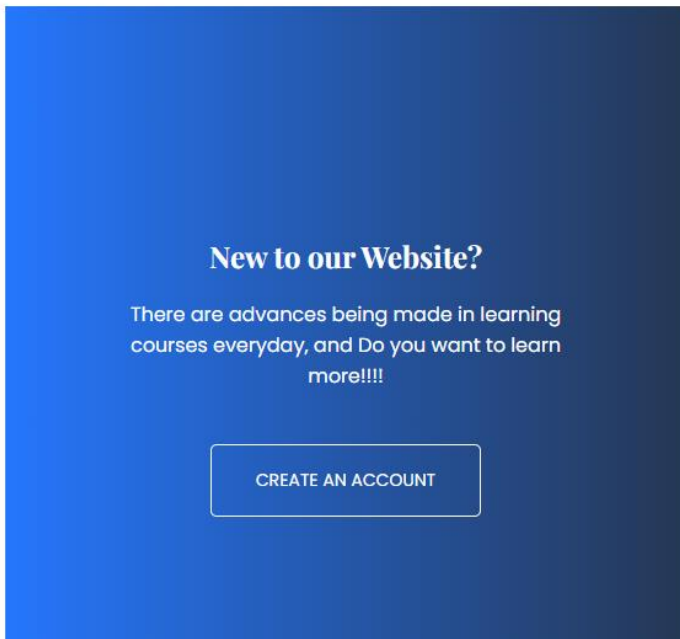CREATE AN ACCOUNT

Welcome Back !!!
Please Sign in now!!!

User Name

Password

LOG IN

Forgot Password?

Figure 11: Login Page

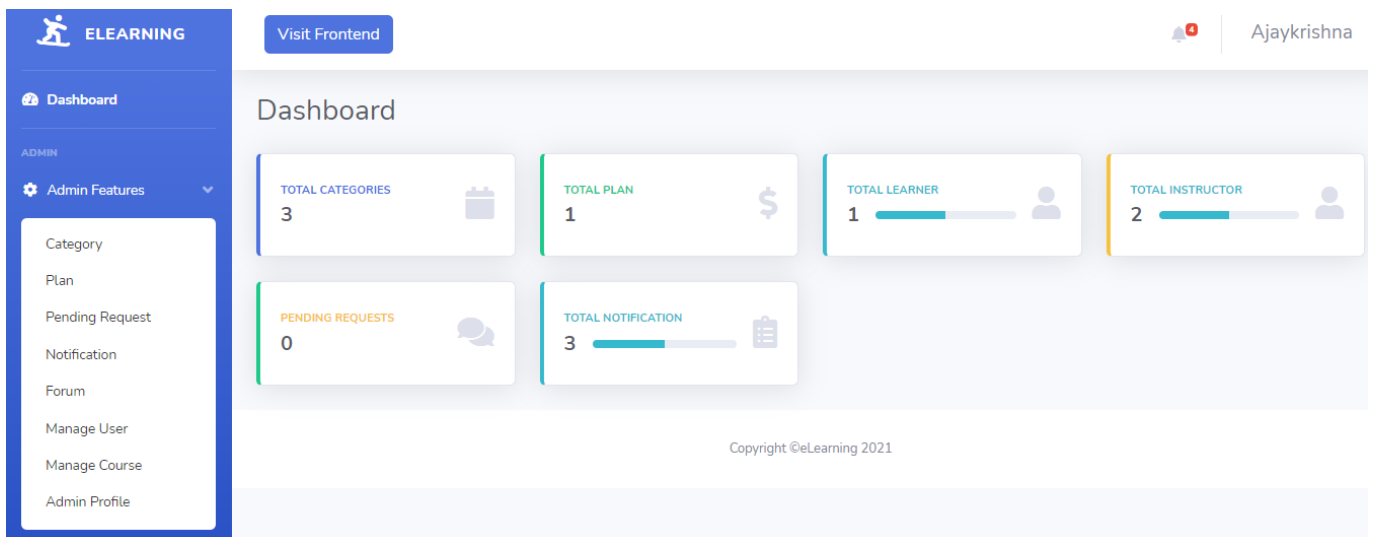**Figure 12: Reset Password**

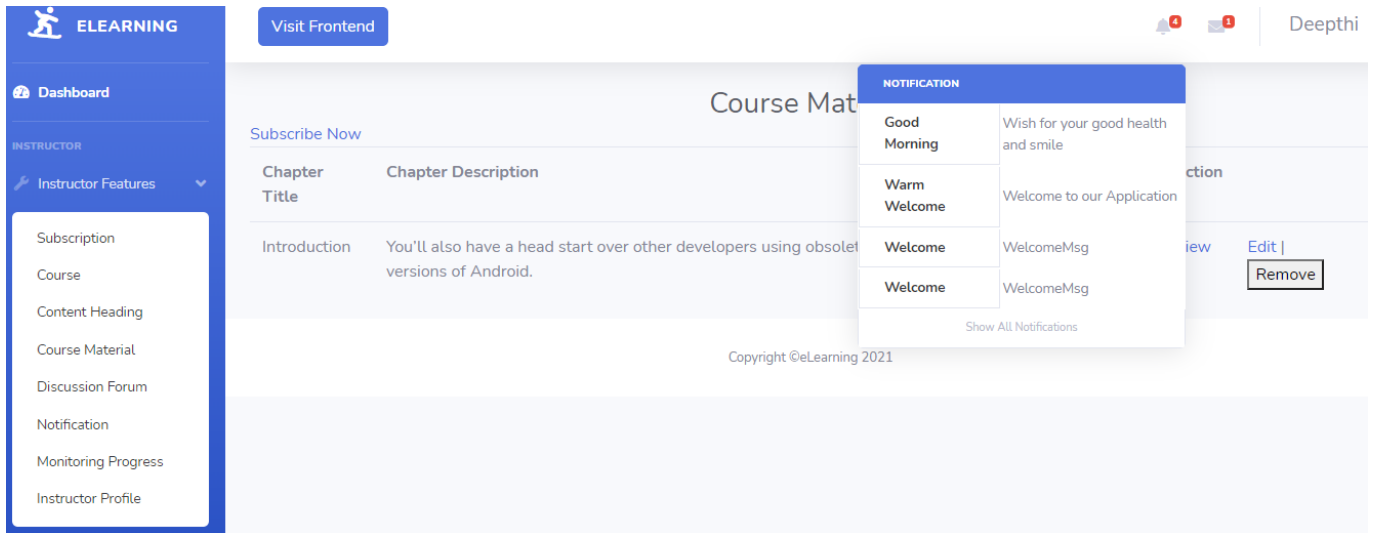**Figure 13: Admin Layout Dashboard**

Figure 14: Course Management Process in Instructor Layout
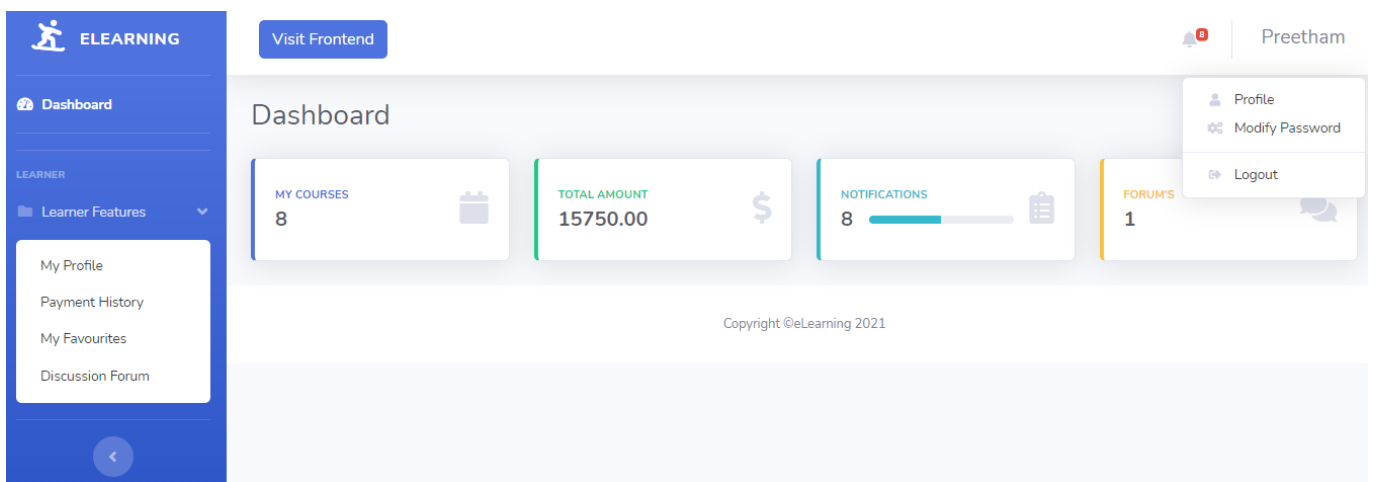
Figure 15: Learner Layout
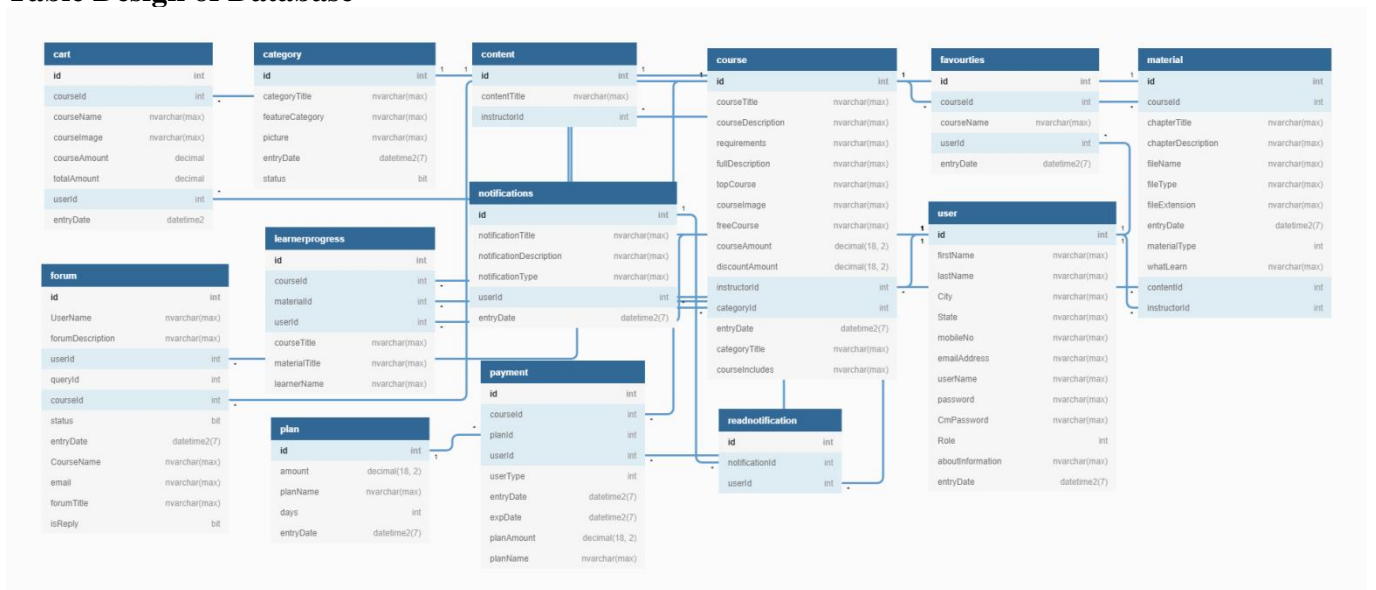
Table Design of Database

Figure 16: ER Model

External Specification

USA	+1 (777) 777-7777			My Courses	My Account	Favourites	Cart
eLearning		**Home**	**Categories**	**Courses**	**Forum**	**Search Course**	**Login**
Shop By Category							
Category Thumbnail				Category Title			
				Top Courses			
Course Information			Add to Cart		Favourites	Price and Discount	

6 Design Units Impacts

Applications are designed to perform certain tasks and thus satisfying the needs of an end user. In a theoretical application development process the designer collects all the requirements, designs the system, performs a verification test to proof that his design meets the specification and hands it over to production. (Pahl et al. 2007) In most product development processes identifying all requirements is among the biggest challenges. It has the potential to increase your performance, efficiency, and the value of your products and services. It can also reduce costs and risks. Effective design can encourage customers to buy from you. It may help your product, service, or company stand out from the crowd - learn more about user-centered design. Design can also add value to products and services. End users are often willing to give more for products that look better and offer greater usability, better functionality and sustainability.

6.1 Functional Area A/Design Unit A

6.1.1 Functional Overview

The main purpose of functional areas is to ensure that all-important business activities are carried out efficiently. If company goals and objectives are to be met, this is critical.

6.1.2 Impacts

This design unit and workflow process enables the computer working functions to adapt the system to the operational requirements and customer requirements. The work process includes authentication, data update, user information update, backup and recovery and administrative process.

6.1.3 Requirements

- ▪ The user authentication process is performed by the administrator

- No login and registration system required to view this application

- Student progress should be tracked by instructor

- External interfaces and internal interface must be properly configured and reliable

- For customer data protection, a data backup process should be included.

6.2 Functional Area B/Design Unit B

6.2.1 Functional Overview

The database needs to be updated and the client's data stored securely in the database. The database is protected and only real users can access the website.

6.2.2 Impacts

It will enable the functionality of the software. A user must be authenticated when attempting to log into the system. They include the end goal, which could be an order system, an online catalogue, or a physical product. Approval workflows and authorization levels may also be included.

6.2.3 Requirements

Examples of functional requirements include: business rules, administrative functions, authentication, authorization levels, external interfaces, reporting, and so on. These requirements also assist the development team and client in ensuring that they are working toward the same goals.

7   Open Issues

➢ No Open Issues

8   Acknowledgements

9   References

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Bonk, C. J. & Graham, C. R. (Eds.). (2005). Handbook of blended learning: Global Perspectives, local designs. San Francisco, CA: Pfeiffer Publishing.

Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. Teachers College Record, 115,1-47.

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Picciano, A., Dziuban, C., & Graham, C. (Eds.) (2014). Blended learning: Research perspectives (Vol. 2). New York: Routledge.

Roblyer, M.D. (2006). Integrating educational technology into teaching. (4th ed.). Upper Saddle River, NJ: Pearson Education, Merrill.

Dziuban, C., Hartman, J., Cavanagh, T. Moskal, P., (2011). Blended Courses as Drivers of Institutional Transformation. A. Kitchenham, Ed. Blended Learning Across Disciplines: Models for Implementation, (pp. 17-37) Hershey: PA: IGI Global.

10 Appendices

```
public ActionResult search(string Name)
{

    CourseView course = new CourseView();
    CourseRepository RCourse = new CourseRepository(eCon);
    course.LCourse = RCourse.GetAll();
    CategoryRepository RCategory = new CategoryRepository(eCon);
    co|
    if |  🔧 class eLearningCore.Repository.CategoryRepository
    {
        return View("CourseList", course);
    }
    course.LCourse = course.LCourse.Where(x => x.courseTitle.Contains(Name, StringComparison.CurrentCultureIgnoreCase)).ToList();

    return View("CourseList", course);

}
0 references
```

Figure 17: Sample Code of Search Function

```
// GET: Instructor/Content
0 references
public ActionResult Content(int? id)
{
    PaymentSubscribe();
    ContentView cont = new ContentView();
    ContentRepository RContent = new ContentRepository(eCon);
    cont.LContent = RContent.GetAll().Where(m=>m.instructorId == Convert.ToInt32(HttpContext.Session.GetString("userid")));
    if (id > 0)
    {
        cont.NContent = RContent.GetContentById((int)id);
    }

    return View(cont);
}
```

Figure 18: Content Action Code in Instructor Layout

Alert & Notification code [AdminController and AJAX]

```
public JsonResult UnreadNotification()
{
    NotificationRepository RNotification = new NotificationRepository(eCon);
    int UserId = Convert.ToInt32(HttpContext.Session.GetString("userid"));
    var notification = RNotification.GetAllUnreadNotification(UserId).OrderByDescending(x => x.entryDate).ToList();
    var rol = HttpContext.Session.GetString("role");
    notification = HttpContext.Session.GetString("role") == "Learner" ?
        notification.Where(x => x.notificationType != "Instructors").ToList() :
        HttpContext.Session.GetString("role") == "Instructor" ? notification.Where(x => x.notificationType != "Learners").ToList()
        notification;
    return Json(notification);
}
0 references
```

Figure 19: JSON Code of UnreadNotification in the Admin Controller

```
<script type="text/javascript">
    setInterval(function () {
        $.ajax({
            url: '/Admin/UnreadNotification',
            type: "POST",
            dataType: "json",
            contentType: "application/json; charset=utf-8",
            success: function (data) {
                var json = data;
                $("#noti").remove();
                $("#notification").append('<tbody id="noti"></tbody>');
                var cnt = 0;
                $(json).each(function (index, item) {
                    var notifyId = json[index].id;
                    var title = json[index].notificationTitle;
                    var desc = json[index].notificationDescription;
                    var parameter = notifyId + ",'" + title + "','" + desc + "'";
                    $('#noti').append(
                        '<tr><td><button class="dropdown-item" data-toggle="modal" data-target="#alertmodel" onclick="read(' + paramet
                        + title
                        + '</strong></button></td><td>'
                        + desc
                        + '</td></tr>'
                    )
                    cnt++;
                    var ncount = document.getElementById('notificationcount');
                    ncount.innerHTML = cnt;
                });
            },
            error: function (data) { alert(data.responseText); }
        });
```

18

Figure 20: AJAX Code of UnreadNotification