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TIGER E-LEARNING SYSTEM

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Abstract

Tiger E-learning System

By

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This thesis describes the development and initial experiences with a web-based system, Tiger E-learning management system developed and designed to facilitate teachers in the management of educational courses for their students, especially by helping teachers and students with course administration. With this system, teachers can monitor the progress of their students.

The goal was creating a course management system that includes: course content organization and presentation, communication tools like message board and internal email system, student assessment tools to help students obtain course material and download and submit assignments and grade book for use of students and faculty members.

Tiger E-learning system can be used to support and organize the work of academic departments, organization and other projects as well as to supervise the work of teacher assistants and students in the field of academic advising.

The most important goal includes providing lecture materials, resources, increasing transparency and getting fast feedback, and increasing contact with and among students.
This web application is implemented with use of Java 2 Enterprise Environment (J2EE) along with Servlet technology. MySQL server is been used as database in this application. We will discuses the implementation issue as well as the features of application.

The purpose of this document is to give a detailed guide to readers about the Tiger E-learning software package. This document gives a system overview, design considerations, architectural strategies, system architecture, detailed system designs, graphical user interface design and finally glossary. After reading this document the reader will have a wider understanding on the design issues that went into the creation of this application. The reader will also know in detail how the modules and components of the application interact and how they contribute to the functionality of the E-learning System. Finally we will discus future possible improvement.
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1. INTRODUCTION

Tiger E-learning system was originally designed to facilitate instructors and students in an academic setting with a shared web based communication environment. The vision behind this project was to establish a user friendly interface that would allow instructors and students to effectively interact with each other. We envisioned organized interfaces, logical menus, structured backgrounds and ease of administration.

E-learning systems are an increasingly important part of academic system in higher education. The factor that has important effects and poses challenges to administrators who need to make decisions about the use of this system is the number of faculties using this system is rapidly increasing.

In college of computer science instructors use different applications to communicate with students, it shows the necessity of such an application but there is not an application that satisfies all needs of instructors and students. Currently faculty members are using personal web sites, CS Network Service (for upload assignments), Wiki and computer science official website. Using different kind of applications by instructor made us to think about developing a consistent application that tries to satisfy all the students and faculty members’ needs.

Some of the factors that increase the needs and obligations of using such applications includes:

- Training from campus training center (for those group of instructor who are not
familiar with using system) to shows the complete functionality of application.

- Department or Administrative pressure.
- Request from student for having reliable resource for getting information.
- Having support group for fixing possible bugs.

The most important thing is that the use of the application should not be time consuming also it should be easy to use and flexible to add more features, in this case once a faculty member starts using the system, the chance that he will use it for ever is high.

The E-learning system can be used for face to face classes also it can enhance distance education classes and hybrid classes.

Faculties and students use E-learning system in teaching and learning to achieve numbers of goals. The most important goals include supplementing lecture materials, improving transparency and feedback, and increasing contact among students.

The students and faculty members can reach these goals by using Tiger E-learning System.

Faculties can upload the course materials and student can download them and communication is possible by using message board and internal Email system.

Tiger E-Learning system will help the faculties to include more interactive materials in their curriculum, allowing them to address diverse learning styles.
Faculty can also use the E-learning system to improve the promptness of the feedback.

Another important aspect of the program is the use of online grade book. Faculty can grade assignments as soon as students upload them.

The software developed to facilitates communication between Instructors and Students. The software purpose is to make online communication also it make class management easier for both the student and the instructor.

It is assumed that students and instructors have access to computers and the Internet and they both have basic knowledge web applications.

The software would compliment a regular college class by enabling the electronic communication, grading, assigning and lab submitting of the course related material. The Tiger E-learning software is not to be a substitute of a regular class environment and communication; it is designed to facilitate interactivity between the instructor and the students in addition to their regular class meetings.

The information objective of the Tiger E-learning System application is to enable communication between Instructor and Students in a class setting. The information that will be managed by the application include: records of the material related e students and instructors, records of assignments required in a given class, records of grades of given assignments, records of events in a given quarter and enrollment records for a given quarter

The function of the software is to organize and keep track of the information
provided by the Instructor and the Students.

The performance of the application fulfills the requirements by the client. All required functionality; data consistency and data integrity is satisfied by Tiger E-learning System.

These four elements: the context, objectives, function, and performance make up the scope of the Tiger E-learning System application. Each must be clear and understandable at both the management and technical levels in order to prevent scope creeping. For the Tiger E-learning System application these definitions are clear and understood both by the client and the technical staff.

The software perspective of Tiger E-learning System is Service Oriented Architecture. Our vision when taking on this project was to facilitate Service to our clients. Our software clearly puts the client first. By using Service Oriented Architecture as an architectural guide we can focus mostly on what the clients need and that those needs get fulfilled.

**User Characteristics**

The Tiger E-learning system was designed with certain assumptions about the users that would be accessing the system. For the Students and Instructors a common assumption shared by this and many other web applications is basic computer literacy and basic hypertext navigation concept.

Software requirements include a GUI capable web browser. Examples of GUI
capable web browsers include:

Internet Explorer, Firefox, Netscape, America Online web browser.

The target users for this Web Application are Students and Instructors that require a more detailed and a more modern way of communication. This software will be especially significant to those classes that need binary files to be submitted and revised electronically.

**Operating Environment**

For Tiger E-learning system to run and operate effectively the server side Operating System must be able to run JSP, MySQL and Java. Examples of these operating systems include but are not limited to: Windows, UNIX, and Linux.

Aside from the server requirements the user of this application will have no hardware requirements, the user only needs to be able to access the internet, through a GUI capable web browser.

The Tiger E-learning System has specific needs for data integrity. MySQL provided us with the basic data storage structure and security. With MySQL we were able to design and implement triggers and constraints so the data would remain safe, synchronized and contention free. More complex database systems would have been unnecessary and overall would slow down the application.
2. RELATED WORKS

There are lots of work have been done to improve the communication between students and instructors. Our campus using some of them including but not limited to CSNS and CS Wiki. Both of them are popular between students and faculties but everybody still feel the need of a single program to make the communication easier.

Many universities have invested in products such as WEBTC or BLACKBOARD which provide facilities for publishing teaching materials and communication tools such as email and threaded discussion tool. These systems have developed the possibility of linking other information management system designed for course administration and content delivery.

A research has been done by one of computer science faculty about Blackboard and use of web technology for classroom. He notes some advantages and disadvantages of using this kind of systems. For example using web as a learning device can be a barrier to students and faculties that has no or little knowledge about computer. In some cases it can be hard for some student to find computer with Internet access. Many instructors also find it daunting to create and support materials via the Web.

Technical limitation can be problem as well such as small bandwidth, limited availability and functionality of tools, incompatibility of programs, and differences among browsers also constrain the instructional designer’s ability to create programs. Bandwidth, that is, the capacity of a network to carry files from one place to another, is a major design consideration. If a network has limited bandwidth, sending large files such
as video clips may be a problem.

Any given tool or software package has limited features. Organizations will likely have limits on what they will purchase due to budgets and standardization issues. In additions, using more software programs means more time needed for training. Once the materials have been produced the instructional designer must make sure the materials are viewable and usable across all platforms (PC Macintosh, UNIX). For example, if you expect your students to view a Microsoft Word document via Blackboard you will want to show them the different ways in which this is handled by PC and Macs.

Not to mentions the different ways in which Web browsers will display a Word document. Netscape Navigator, Internet Explorer, and America Online are some of the most popular browsers and each have different versions which makes matters more complicated. Materials should be designed for the lowest common denominator, the oldest and least functional browsers.
3. TECHNICAL BACKGROUNDS

Tiger E-learning system is a web based application. Web applications are popular due to the ubiquity of the browser as a client, a thin client. The ability to update and maintain Web applications without distributing and installing software on potentially thousands of client computers is a key reason for their popularity.

There are lots of popular technologies available for web developer. In fact you can not call them completely different technologies; some of them are just an improved or advanced version of others. We will briefly introduce these technologies including: MySQL, Apache, Servlets JSP, ASP.NET

In this project we used servlet and JSP technology because java servlets are more efficient, more powerful, more portable, easier to use, safer, and cheaper than many other alternative technologies.

With traditional technologies, each time a new process starts for a new HTTP request. If the program is relatively short, the overhead of starting the process can dominate the execution time, but with Servlets, java virtual machine stays running and handles each request with a lightweight java thread not a heavyweight operating system process. If there are n request to program, the code runs n times, but in java for n request it creates n threads but only one copy of Servlet class will be loaded. This approach reduce server memory requirement, another problem accurse when the program finishes handling a request, the program terminate this approach make it difficult to cache
computation, keep database connection open however servlets remains in memory even after they complete a request, so it is straightforward to store arbitrarily complex data between client requests.

Servlets have an extensive infrastructure for automatically parsing and decoding HTML form data, to read and set the headers, tracking session and handling cookies in traditional programming you have to do most of them by yourself.

Servlets support several capabilities that are difficult or impossible to accomplish with regular traditional programming. Servlets can talk directly to the web server whereas many of traditional programming language cannot (with out using server-specific API). Communicating with web server make it easier to translate relative URLs into concrete path names, for instance multiple servletes can also share data, make it easy to implement database connection pooling and similar resource-sharing optimization. Servlet can also maintain information from request to request, simplifying techniques like session tracking and caching of previous computations.

Servlets are written in the java programming language and follow a standard API. Servlets are supported directly or by a plug-in on virtually every major Web server. For example servlets written for Macromedia Jrun can run virtually unchanged on Apache Tomcat, Microsoft Internet Information Server (with a separate plugin) and IBM WebSphere, iPlanet Enterprise Server, Oracle 9i AS, or StarNine WebStar. They are part of Java2 platform, Enterprise Edition, so industry support for servlets is becoming even
more pervasive.

With Servlets and JSP you can start free or inexpensive server and migrate to more expensive server with high performance and capabilities or advanced administration utilities only after your project meet initial success.

One of the main source of vulnerabilities in traditional programming is from the fact that program are often are executed by general-purpose operating system shells, so the programmer must be careful to filter out characters such as backspace, quotes and semicolons that are treated specially by the shell. Implementing this precaution is harder that what it comes to mind, and weaknesses stemming from this problem are constantly being uncovered in wildly used traditional programming libraries.

**Java Servlet Technology Versus ASP .NET Technology**

Building a program on Java Servlets and JSP enables Java programmers to produce dynamic Web pages in a manner similar to Microsoft's ASP. JSP has advantages over ASP. For example, it needs to be interpreted only once and runs on server platforms other than Windows.

Because of the fact that people consider using other operating system than windows, using technology like java that can run on all platforms seems more reasonable. Finally Servlets and java technology is more mature than .NET technologies and also being more familiar with java make us chose using Servlet and JSP over other available
MySQL Database

The MySQL database has become the world's most popular open source database because of its consistent fast performance, high reliability and ease of use. It's used in more than 10 million installations ranging from large corporations to specialized embedded applications on every continent in the world.

Not only is MySQL the world's most popular open source database, it's also become the database of choice for a new generation of applications built on the LAMP stack (Linux, Apache, MySQL, PHP / Perl / Python.) MySQL runs on more than 20 platforms including Linux, Windows, OS/X, HP-UX, AIX, Netware, giving you the kind of flexibility that puts you in control.

Whether you're new to database technology or an experienced developer or DBA, MySQL offers a comprehensive range of certified software, support, training and consulting to make you successful.

We used MySQL environment as database because it is easy to maintain and it is secure although it is an open source because it is widely use the support is available.

To administer MySQL databases one can use the included command-line tool (commands: MySQL and MySQLAdmin). Also downloadable from the MySQL site are GUI administration tools: MySQL Administrator and MySQL Query Browser. Both of the...
GUI tools are now included in one package called MySQL GUI Tools.

MySQL is a multithreaded, multi-user, SQL Database Management System (DBMS) with more than six million installations.

**JDBC**

JDBC is an API for the Java programming language that defines how a client may access a database. It provides methods for querying and updating data in a database. JDBC is oriented towards relational databases.

The Java Platform, Standard Edition includes the JDBC API together with an ODBC implementation of the API enabling connections to any relational database that supports ODBC. This driver is native code and not Java, and is closed source.

**Model View Controller Architecture (MVC)**

MVC is a design pattern used in software engineering. In complex computer applications that present lots of data to the user, one often wishes to separate data (model) and user interface (view) concerns, so that changes to the user interface do not impact the data handling, and that the data can be reorganized without changing the user interface. The model-view-controller design pattern solves this problem by decoupling data access and business logic from data presentation and user interaction, by introducing an
intermediate component: the controller (look at Figure 3.1). A simple diagram depict the relationship between the Model, View and Controller. Note: the solid line indicates a direct association, and the dashed line indicates an indirect association.

Figure 3-1 MVC Architecture

It is common to split an application into separate layers: presentation (UI), domain, and data access. In MVC the presentation layer is further separated into View and Controller. MVC encompasses more of the architecture of an application than is typical for a design pattern. Hence the term architectural pattern may be useful [1], or perhaps an aggregate design pattern.

Model

It is the domain-specific representation of the information on which the application operates. The model is another name for the domain layer. Domain logic adds meaning to raw data (e.g., calculating if today is the user's birthday, or the totals, taxes and shipping charges for shopping cart items).

Many applications use a persistent storage mechanism (such as a database) to store data.
MVC does not specifically mention the data access layer because it is understood to be underneath or encapsulated by the Model.

View

It renders the model into a form suitable for interaction, typically a user interface element. MVC is often seen in web applications, where the view is the HTML page and the code which gathers dynamic data for the page.

Controller

Processes and responds to events, typically user actions, and may invoke change on the model.

In this project we tried to use MVC for our design and implementation. The user acts in two roles, model and also controller, and view is the JSPs that create the pages.
4. SYSTEM FEATURES

Secure Login

It’s first and probably most significant feature is the Secure Logon. When the application is first called up, the only thing that is viewable is a screen with a button that allows the user to login or register as a new user.

After the user has registered, a unique user name and password are created for that specific user. The user ID is constant and unchanged while the user is enrolled in that class for that specific quarter.

Security was one of the most important concerns to us since student’s grades and instructors grading abilities are extremely important and must be kept free from outside unauthorized access.

Static Data Storage

Since the application will be accessed throughout the quarter in which the student is taking the class and in which the teacher is teaching the class, the data records of the communication and the records of the assignments and events must be kept in statically. The application stores user data, enrollment data, assignment data and calendar events dynamically making Course Management System successful in maintaining information even in the event of a server crash.
Upload Resources and Assignments

File upload is an important part of the Tiger E-learning System application since it enables users to upload assignments. This feature uses the “pull” information, in which a user is able to upload and download the files stored on the system. Tiger E-learning System uses a Java based Servlet that secures the file and stores it in the appropriate folder according to the specific user that is logged in. With our file upload feature the student will be able to upload common videos files which can include MPG, MOV, AVI, MPEG, QTW and QT. The user will also be able to upload image files such as BMP, GIF, GPG, JPEG, PCX, TIF and PNG. Other types include sounds like AIF, AU, MID, MIDI, MP4, RA, RAM, RM and WAV. MS PowerPoint presentations, MS Word documents, MS Excel spreadsheets, MS Access Databases can also be uploaded.

Message Board

The Tiger E-learning System message board is a handy tool for those students who wish to participate in class discussions either based on topics or just following a certain thread. Users will be able to post new messages and to reply to old messages. Threads can be started and replied by other students and/or instructors. The messages are statically stored in MySQL database, increasing the safety and consistency of the communication. This message board is a major part of this software package since the main goal of the software developers was to offer a communication environment for the students and teachers. The message board will be a main place where discussion and
other messages can be shared amongst classes and instructors.

**Calendar**

The calendar is a very special feature in our Tiger E-learning System. It will display your typical monthly calendar with the current month and the current day selected. It will look into the assignments database and pull out any posted assignments and their specific due dates. The users when first launching the application and logs in successfully will see a page that displays a public calendar which keeps track of homework assignments and their respective due dates. The student and instructor will have the capability of seeing newly posted assignments or newly posted labs as well as their due dates. Keeping the student informed about incoming events is essential for Tiger E-learning System.

**Internal Email Communication**

Tiger E-learning System also enables users to use an internal email system. This email system will allow users to email other class members as well as the instructors. The instructor will have the ability to push information to the students. This means that the instructor will be able to send email to the desired users and the user will receive the email. The student doesn’t have to go to a certain place and retrieve the information like in the message board. The student will receive the information automatically.

Pushing information is a good way for an instructor to send time sensitive
information as well as critical messages that are vital for the student’s success in the
class.

Account Management

Tiger E-learning System makes it easy for the users to manage their account. They can edit their profile information using our profile option. They can edit their first name, last name and password. Other account management is done by the Administrator who is in charge of adding and deleting users from the system.

Wikipedia Search

It gives the ability to search through online encyclopedia (WIKIPEDIA).
5. USE CASE MODEL

There are different Roles in Tiger E-learning System, As you will see different roles have different access levels.

Figure 5-1 Roles

![Roles Diagram]

Figure 5-2 User Login

![User Login Diagram]
As diagrammed in Figure 5-2, the entry point to the Tiger E-learning System is the initial login. There exist three user levels in Course Management System. The first is Instructor, the second is the Administrator, and the third is the Student.

When the user first submits a registration request to the instructor, he will have no access to the application. After his registration has been approved then the user will either have an Instructor, Administrator or Student access level. The figure above depicts how the user would login and depending on the users access he would access his appropriate level screens. In the following sub sections we will further discuss different access levels.

**Instructor Login**

After the user has logged in at an Instructor level, he/she will have access to the menu options shown in figure 5-2. Notice how the instructor has the ability to create and delete assignments a feature that a user at a student level will not be able to achieve. The changes made to the assignments page will be reflected in the calendar. Another detail to be noted is that the user at an Instructor Level will be able add and delete students from classes he is currently enrolled. Look at Figure 5-3.

**Student Login**

After the user has logged in at a student access level, he will be able to view the calendar events and course information. As you see in figure 5-4 the user will be able to
view and submit assignments, view grades as well as upload files and write posts and send emails. The user level has the least access to the system however the limited access level will not limit or diminish his/her communication ability with the instructor or other students.

Figur 5-3 Instructor Login
Finally we arrive at our third user level: Administrator. This level has the highest level of security. As you see in Figure 5-5 The administrator is in charge of adding and deleting students and instructor’s accounts as well as maintaining the overall user levels and class organization. Having an administrator level user was vital for the maintenance of the Tiger E-learning System. Since the administrator has the ability to change user levels to all registered users in the class, he/she will be able to basically administer an extra level of security, for this reason the Administrator level should be granted in a guarded manner.
Figure 5-5 Administrator Login
The Tiger E-learning system contains 4 main folders that you see in Figure 6-1. Source folder contains the Java source codes, Libraries folder contain all essential libraries for project, classes folder contains the complied version of Java codes and also all the jsp files.

Figure 6-1 Tiger E-learning System

The library contains some essential jar file like pop3.jar, mail.jar, smtp.jar, mailapi.jar for Email feature and it contains catelina-root.jar necessary library for Apache tomcat also contains a library for calendar named calendarPackage.jar. UploadPackage.jar for upload and eventually mysql-connector-java-5.0.3-bin.jar for connecting to MySQL database

The library directory contains these jar files:
• POP3.jar
• SMTP.jar
• Mail.jar
• MailAPI.jar
• UploadPackage.jar
• Commons-fileupload-1.1.1.jar
• jstl.jar
• commons-io-1.2.jar
• Activation.jar
• CalendarPackage.jar
• Dsn.jar
• Standard.jar
• Imp.jar
• catalina-root.jar
• mysql-connector-java-5.0.3-bin.jar

The source directory contains 12 java source codes, after compiling, the classes are responsible for interaction between database and jsp files. List of source codes are shown below.

• AssignmentBean.java
• CourseBean.java
All the Beans contain java codes that make connection between application and database.

AssignmentBean class controls everything related to an assignment, like course, weight of assignment, percentage of final grade and also due date and date that instructor wants to release the assignment.

CourseBean class make connection between application and several tables related to course like enrollment and course table itself. It gives the ability to get the users that dropped from a course or enrolled in one.

FileBean class is used for uploading course materials, assignments. It keeps track
of records by adding them to database and save the actual file in a specific folder in
server.

EnrolmentBean is used for insert information about user and course into enrolment table.

GradeBean and GradeDefBean are used to interact with grade, assignment and
course table. It will automatically pull out the grade that corresponds with the given
percentage.

Message board will be control by the work of PostBean class.

SendEmailServlet class extends HTTPServlets, and it is being used for sending
emails.

List of JSP files are shown below that are responsible for making screen as well
as controlling the actions.

- Admin.jsp
- Assignment.jsp
- Authenticate.jsp
- Board.jsp
- Calendar.jsp
- Course.jsp
- CourseDetail.jsp
- Display.jsp
- Email.jsp
- EmailDetail.jsp
- Error.jsp
- Grade.jsp
- Email.jsp
- EmailDetail.jsp
- Error.jsp
- Grade.jsp
- Login.jsp
- NewAssign.jsp
- Post.jsp
- Profile.jsp
- Register.jsp
- Roster.jsp
- SendEmail.jsp
- Upload.jsp
• Ag.jsp

Figure 6-2 demonstrates the database tables and fields used in the Tiger E-learning System application.
Figure 6-2 Database Schema

- assignment
  - aid
  - title
  - description
  - next_grade
  - weight
  - cid
  - start_date
  - due_date

- classes
  - code
  - description

- course
  - cid
  - name
  - ctime
  - roomno
  - uid

- enrollment
  - uid
  - cid
  - edate

- file
  - fid
  - name
  - title
  - description
  - aid
  - cid
  - uid
  - timeup

- grade
  - aid
  - uid
  - assigned_grade
All are shown with their respective attributes. Primary keys are distinguished with a key sign next to them. And their relationship is shown in figure 6-3.

Figure 6-3 Relationship between tables
7. IMPLEMENTATION

Introduction

Tiger E-learning System provides the user with user friendly GUI menus and an easy way to navigate through the application. Following are screen shots of the program. Also next to each screen shot we have a set of instructions that shows what those pages functionally offer the user and how they are linked to other JSP pages.

Entry Page

This screen allows the user with different level of security logs in to application also you have ability to search through WikiPedia from entry page. Look at Figure 7-1.

Registration Page

When the application is first accessed via http://internetpath/cms/login.jsp you have the opportunity to register for an account if you don’t have one.

The registration page is in figure 7-2. The information required to obtain an account as you see in the figure is your first name, last name, email address and a password. Once the user has successfully registered, she or he should wait for an email from administrator to authorize the access, after that the user can successfully log in. The
screen in figure 7-4 will be accessed. However if the user name or password is incorrect
the screen in figure 7-3 will display. The error screen will provide the user with the
opportunity to try again to login. It is up to the user to remember the login names and the
passwords.

Figure 7-1 Entry Page
The error page is shown on next page gives the user an opportunity to request an email with your password just in case the user forgets it. The application will open up figure 7-3 which will enable the user to enter an email address. From this point on the application will check to see if the email address is a registered user name. If it is, then an email containing the correct user password will be generated and sent to the users email address. Also form this page the user will be able to click on the ‘Try again’ link to go back to the login page and try logging in again.
Home Page

Once the user has successfully logged in, the page in figure 7.4 will be displayed. This page will be referred to as the Home page from now on.
As you see in figure 7.4, right underneath the Welcome username message the level of the user is displayed, if the user is logged in as a student, the word student will be displayed, if the user logged in as faculty, the word faculty will be displayed and finally if the user is logged in as an admin the word admin will be displayed. This is a feature that helps the user know what user level has been granted to him/her during the approval of their registration. This page also displays a menu bar to navigate the site and an up-to-date upcoming events list.
Menu Bar

First option in the menu bar is Home. This link will redirect the user back to the Home page. The other options in the navigation bar are discussed below.

Course Page

From the Home screen the courses item in the navigation bar can be selected and the user will be redirected to the Courses page. As a student in the courses page the user will be able to view a list of classes in which he/she is enrolled in and enroll or drop a class. The details for the list of courses includes the Professor teaching the class, the room and the time in which the class takes place for details look figure 6-5.
The user who has the instructor role will be able to add or remove a course. Look at Figure 7-6.
Course Detail Page

The Course Detail page displays more specific information about the classes listed in the Courses page. A full description of the class can be seen at this page as well as the list of assignments. Downloading the course material is possible and also assignment details include the assignment title, the assignment description, total point allocated for this particular assignment, the date in which the assignment was listed and
the due date of the assignment. The other function available for student and faculty is the ability to make an announcement and reply to a specific announcement. List of student enrolled in a class will be available for instructor. The instructor has ability to remove a student from a class. For Details look at Figure 6-7, Figure 6-8 and Figure 6-9.

Users with different level of security see this page differently.

Figure 7-7 Student Course Detail

![Student Course Detail](image)

From This screen a student user can download the course materials, power points and other resources for specific courses also see assignments and announcements.
Figure 7-8 Instructor Course Detail
Figure 7-9 resume Instructor-Course Detail

By clicking on an assignments it redirect the user to another page as student user you can upload the assignment look at Figure 6-10 and view your grade in that page 6-11.
Figure 7-10 Upload Assignment
Figure 7-11 View Grades.

Underneath the list of assignments there is a link to the message board. This link will redirect the user to the message board page. As you see in Figure 7-12.
Calendar

From the navigation bar the user will be able to click on Calendar. Clicking on the bar will redirect the user to a Calendar page where events can be created by instructors and administrators and viewed by students. Assignments will also be listed here. Their start and due date will be listed in the appropriate dates. Look at Figure 7-13
Figure 7-13 Calendars
Creating New Assignments

One of the functions in course detail screen for instructors is creating new assignments. As you see in figure 7-14 when instructor creates assignment he/she can name it and make a description for assignment as well as the weight of assignment.

Two other important elements are due date and the date that assignment will be released in the case that instructor prepares assignment a head of time and want to release that in certain time.

Figure 7-14 Create Assignments
Grade Assignments

Instructor can grade assignment as it shown in figure 7-15.

Figure 7-15 Grade Assignment

Upload Resources

The upload screen is available via course screen in for students and instructors. The user will be able to use this page to upload assignments or upload course resources in different types of formats. Different file formats include common videos files which can include MPG, MOV, AVI, MPEG, QTW and QT. The user will also be able to upload
image files such as BMP, GIF, GPG, JPEG, PCX, TIF and PNG. Other types include sounds like AIF, AU, MID, MIDI, MP4, RA, RAM, RM and WAV. MS PowerPoint presentations, MS Word documents, MS Excel spreadsheets, MS Access Databases can also be uploaded. You can look at figure (course detail instructor) to see how a user can update files. Or look at figure 7-16. To see how it works for update assignment for a student.

Figure 7-16 Upload Material
Email

The email page is displayed in figure 7-17. Students will be able to send emails to other classmates as well as teachers. Email communication is an important part of the Tiger E-learning System. The user will be able to select recipients, create a subject and create the body of the email.

Figure 7-17 Email
Profile

As you see in figure 7-18 all levels of users have the ability to edit their own profiles. They can change their first name, last name and passwords.

Figure 7-18 Profile.
Administrator's Screen

Figure 7-19 is the screen that grants and revokes permission. It is accessible with a user with admin role. When a user registers him/herself, it will be added to the screen but it will stay in pending status until the administrator accepts their registration.

Figure 7-19 Admin Screen
The profile screen with Admin access that is shown in figure 7-20 can give the administrator the ability to change the security level or allow a user to use the system or even invoke the right to access.

Figure 7-20 Admin Control Screen
8. CONCLUSION

There are many aspects to consider when we are developing an Electronic Learning System. This system is used in wide range in educational systems for both regular and online classes.

Tiger E-learning System provides lots of useful features for students and faculties to communicate with each other. For faculties to provide wide range of resources for their students, open a discussion floor for a challenging subject; organize their works and a lot more. For students, also to organize their works, work as member of a group on a particular assignment, use the shared resources and more. Generally it helps the educational system to reach their goal in much shorter time but more efficient manner.

Providing all the above facilities and features in a program considering the fact that it should be user friendly and having constant stable performance, need a lot of work and time consumption.

Tiger E-learning System has very organized source code; which can be easily edited and changed for future needs and necessities like knowledgebase system and instance messaging system.
Bibliography


