A Project Report
On

E-Learning Solution using LAMP Technology
(Integrating the power of Linux, Apache, MySQL and PHP)

Group no-12

Submitted in partial fulfillment of the requirements for the Major Project II of

Bachelor of Technology
In
Computer Science & Engineering

Submitted by:

Ina Garg	**R780209015**
Shivam Sharma	**R780209031**

Under the guidance of:

Mr. Hitesh Kr. Sharma

Department of Computer Science & Engineering
COLLEGE OF ENGINEERING STUDIES
UNIVERSITY OF PETROLEUM & ENERGY STUDIES
Dehradun - 248007

CERTIFICATE

This is to certify that the Project entitled **"E-Learning Solution using LAMP Technology"** submitted by

Ina Garg	**R780209015**
Shivam Sharma	**R780209031**

for the partial fulfillment of the requirements of the course **Major Project II** of **Bachelor of Technology in Computer Science & Engineering** degree of **University of Petroleum & Energy Studies, Dehradun** embodies the confide work done by above students under my supervision.

Signature of Mentor
Mr. Hitesh Kumar Sharma
Assistant Professor

DECLARATION

We, Shivam Sharma and Ina Garg bearing the Roll No: R780209031, R780209015 respectively hereby declare that this Project work entitled "**Developing web service (E-Learning Solution) using LAMP technology**" was carried out by us under the guidance and supervision of Mr. Hitesh Kr. Sharma. This Project work is submitted to University of Petroleum & Energy Studies in partial fulfilment of the requirement for the award of Bachelor of Technology in Computer Science and Engineering during the Academic Semesters July 2012 - Dec – 2012 and Jan 2013- April 2013. We also declare that, we have not submitted this dissertation work to any other university for the award of either degree or diploma.

Shivam Sharma

Ina Garg

Place: Dehradun

Date: 18th April, 2013

ABSTRACT

The idea behind the working out of the current project is to develop a web service using the same software development suite that was integrated as a part of the first phase of the major project being developed as a part of the Final Year curriculum.
For the above said purpose, a **pre-conceived** case study is being considered, according to which a project has to be undertaken for providing **automated solution** to the problems faced by an **E-Learning Organization** in its functioning and ultimately in conducting its business. Not only is the organization management, but the students being served by the organization are also facing the problem.
Based on the key observations of the current system, it is decided to develop an E-Leaning site for Fast Learn (the company). This type of a web site will prove an efficient means of learning solution for the people who are not able to have access to the education and even those who face difficulty in using the services offered by such organizations.
This web site will be deployed using the LAMP platform, the integration of which was the aim of the initial efforts in the direction of **open-source development.**

Contents

Chapter 1 Introduction

In the current project, we have undertaken a case study that involves developing an automated **E-Learning Solution** for a **distance – learning institute,** that offers service to students, by using traditional methods of course delivery. These methods involve manual processes that create hindrance not only by bringing down the ratings and doing nothing but creating dissatisfaction among the students. Understanding the dire need of the company management, to have a system that is efficient and reliable not only from the organization's point of view, but also from the perspective of the students, who are going to be on the receiver's end, company has decided to go automatic through its services. In other words, with this model of course delivery, Fast Learn is losing out on its core objective of providing faster learning to students.
Based on the key observations of the current system, is decided to develop an E-Leaning site for Fast Learn (the company).

As an extension to the previous project, the deployment platform for this project is going to be the LAMP platform obtained after integration of the LAMP stack in the **First major Project**
LAMP stacks for development parallel to Java/J2EE and Microsoft .Net architectures, which turns out to be cheaper option to get the same functionally since the complete stack is based on open source applications.

1.1 What is LAMP

LAMP is a solution stack of free, open source software. The acronym *LAMP* refers to the first letters of Linux (operating system), Apache HTTP Server, MySQL (database software, but now sometimes MariaDB) and originally PHP (but now sometimes Perl or Python), principal components to build a viable general purpose web server.

The exact combination of software included in a LAMP package may vary, especially with respect to the web scripting software, as PHP may be replaced or supplemented by Perl and/orPython. Similar terms exist for essentially the same software suite (*AMP*) running on other operating systems, such as Microsoft Windows (WAMP), Mac OS (MAMP), Solaris (SAMP), iSeries(iAMP), or OpenBSD (OAMP).

Though the original authors of these programs did not design them all to work specifically with each other, the development philosophy and tool sets are shared and were developed in close conjunction. The software combination has become popular because it is free of cost, open-source, and therefore easily adaptable, and because of the ubiquity of its components which are bundled with most current Linux distributions.

When used together, they form a solution stack of technologies that support application servers.

1.2 Why LAMP

It is the preferred option for developers for creating a stable, reliable and highly efficient application and ultimately follows FOSS approach.

Benefits of FOSS Approach
Each of the components in the LAMP stack is an example of Free or Open Source Software (FOSS).
The benefit of the FOSS approach is three-fold.

- It is FREE
- No Licensing Issues
- Software development process and accessibility

Some popular LAMP applications:
MediaWiki, Web based wiki software written in PHP language,
MoinMoin[2],
Slashdot: news/discussion forums,
PHP-Nuke: Content Management System,
and Database Management GUI Interface such as phpMyAdmin.

According to the NetCraft: ,***http://news.netcraft.com/archives/web_server_survey.html***) around 70% of all web domains are hosted on LAMP Platforms.One advantage of LAMP from our personal perspective is the substantial flexibility for different database, web server, and scripting languages.
Popular substitutes:

MySQL: PostgreSQL, SQLite and DB2.
PHP: Python, Perl, and Ruby.
Apache: While Nginx, Cherokee and Lighttpd.

1.3 Benefits of LAMP

The benefits of the LAMP stack are illustrated by the number of proponents of this system. Benefits of using LAMP include:

Easy to code: Ask all developers and they will tell you that coding is a breeze on LAMP. What this is does is that it ensures that coding is relatively bug free and doesn't have to go through an exhaustive and time consuming process of fixing the bugs.

Easy deployment: For many developers, it's the deployment of a web application that becomes a tricky exercise; especially when the programming language cannot be easily integrated with the server and database. But, there are no such problems with LAMP as PHP is a standard Apache module, Making deployment easier.

Local Development – Another huge advantage of using LAMP is that a developer can build an app locally and then deployed it onto the web.

Chapter 2 Case studies and Related Work

2.1 Case Studies

2.1.1 LAMP Security - A Case Study of a LAMP Appliance

Today in this world of cloud computing everyone wants to migrate their applications to some type of hosting platform. The goal is to get your web application up and running quickly without the need for over complicating the configuration of different services (Right now every single security person is probably yelling at me for that last statement). While it is true that you'd want to deploy your application quickly so as to have your customers start using it, you don't want to blow off the configuration details or lack of security. Many of these applications are housed on a LAMP stack, and for those of you that don't know: Linux Apache MySQL PHP. Let's look at a sample deployment scenario, which involves setting up a LAMP Stack.

Since I would like to hit the ground running I want a LAMP stack that is pre-configured to start off with. It just so happens that Turnkey Linux makes a pre-made LAMP appliance and ISO. This image is based on Ubuntu 8.04LTS and is updated to include security patches and additional features (see the change log for complete details). You can run the ISO as a Live CD to test out the product, which is what I'm going to do instead of installing it into the could. By default the following connections are available when the system boots up (all IP addresses are based on a DHCP address my system received during boot).

Web http://192.168.1.6
https://192.168.1.6
Web Shell https://192.168.1.1:12320
Webmin https://192.168.1.1:12321
PHPMyAdmin https://192.168.1.1:12322
SSH/SFTP root@192.168.1.6 (port 22)

This is a large number of connections available for a preconfigured appliance and helpful for those that want many different ways to connect in and work on their system.

Problem #1

Each connection is configured with a login that uses the username 'root' and NO PASSWORD!

Right away we can see that there is an issue with the way logins are configured here. First of all the root user should never be able to connect remotely, let alone have a blank password. Secondly, had the system been configured with a normal user they still should not use a blank password. Many new system administrators that don't always check the connections to their system (sometimes because they may not have even learned how), may forget to shutdown a particular connection or change the password. With a blank password configured on the root account (or any account for that matter), it is only a matter of hours or minutes before you get picked up by malicious users scanning the internet.

Mitigation

Setup default LAMP installs with a specific user that can be used for testing if you are building an appliance, or only create accounts for users that need them. All access to the root account should be cut off and a random strong password should be set. All users accounts on the system should have a password even if just for demo purposes. The following list should also be avoided when choosing a password even if for demo purposes:
admin
password
root
toor

Now that our system is up and running we can start to look around at the default settings and software that comes with it. The most obvious choice is to check out the homepage that the web server displays. Navigating to http://192.168.1.6 brings us to a custom made index.html that presents us with the different ways that we can log into the system. First let us take a look at the PHP info page, which will show us all the information about PHP for this appliance.

PHP Version 5.2.4-2ubuntu5.10

System	Linux lamp 2.6.24-27-generic #1 SMP Fri Mar 12 01:10:31 UTC 2010 i686
Build Date	Jan 6 2010 21:40:47
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php5/apache2
Loaded Configuration File	/etc/php5/apache2/php.ini
Scan this dir for additional .ini files	/etc/php5/apache2/conf.d
additional .ini files parsed	/etc/php5/apache2/conf.d/mysql.ini, /etc/php5/apache2/conf.d/mysqli.ini, /etc/php5/apache2/conf.d/pdo.ini, /etc/php5/apache2/conf.d/pdo_mysql.ini
PHP API	20041225
PHP Extension	20060613
Zend Extension	220060519
Debug Build	no
Thread Safety	disabled
Zend Memory Manager	enabled
IPv6 Support	enabled
Registered PHP Streams	zip, php, file, data, http, ftp, compress.bzip2, compress.zlib, https, ftps
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, sslv3, sslv2, tls
Registered Stream Filters	string.rot13, string.toupper, string.tolower, string.strip_tags, convert.*, consumed, convert.iconv.*, bzip2.*, zlib.*

This server is protected with the Suhosin Patch 0.9.6.2
Copyright (c) 2006 Hardened-PHP Project

Now for those of you that have viewed this page before you already know the wealth of knowledge you can learn about your PHP installation from this page. For those that haven't seen it before you should look through carefully and see what this page exposes about your setup (pretty much everything). We will notice that the version of PHP being used here is 5.2.4, which sadly is out of date.

Problem#2

The current version of PHP is 5.3.3 and if you do a quick check the Ubuntu repositories have version 5.3.2 available. Understandably no appliance can keep up with the latest versions of everything, but the change log and Turnkey's site indicate that the last date the appliance was compiled was April 2010 (fairly recently). There was a patch that went into PHP as of version 5.2.6 to prevent SQL Injection as well. Magic quotes are also disabled in this version of PHP however they are in the most recent version of PHP (5.3.3) as well to encourage better programming habits. They depreciated the option in hopes that

developers give up on the input part. They are just no longer interested in it.

Mitigation

The ISO could have updated their version of PHP to a more recent one. They also could warn users that magic quotes are no longer used for PHP web applications.

Looking elsewhere on this page we can also see that the default server headers show all information about the server, software, and their versions. This is just like opening the door to hackers looking to exploit specific software versions on your LAMP stack.

HTTP_USER_AGENT	Mozilla/5.0 (Windows; U; Windows NT 6.1; en-US) AppleWebKit/533.4 (KHTML, like Gecko) Chrome/5.0.375.125 Safari/533.4
HTTP_REFERER	https://192.168.1.6/
HTTP_ACCEPT	application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,image/png,*/*;q=0.5
HTTP_ACCEPT_ENCODING	gzip,deflate,sdch
HTTP_ACCEPT_LANGUAGE	en-US,en;q=0.8
HTTP_ACCEPT_CHARSET	ISO-8859-1,utf-8;q=0.7,*;q=0.3
HTTP_COOKIE	pmaCookieVer=4; phpMyAdmin=959dc480a86e066a2d8f298d980904a124b2691f; pma_mcrypt_iv=x4X%2BRNncHEc%3D; pmaUser-1=YEMs5SOBu9o%3D; pmaPass-1=YQF4YTp5Kc4%3D; pma_lang=en-utf-8; pma_charset=iso-8859-1; pma_collation_connection=utf8_unicode_ci; testing=1; sid=3d37058f7412e75223e079344efff9e3; pma_fontsize=82%25
PATH	/usr/local/bin:/usr/bin:/bin
SERVER_SIGNATURE	<address>Apache/2.2.8 (Ubuntu) mod_python/3.3.1 Python/2.5.2 PHP/5.2.4-2ubuntu5.10 with Suhosin-Patch mod_ssl/2.2.8 OpenSSL/0.9.8g mod_perl/2.0.3 Perl/v5.8.8 Server at 192.168.1.6 Port 443</address>
SERVER_SOFTWARE	Apache/2.2.8 (Ubuntu) mod_python/3.3.1 Python/2.5.2 PHP/5.2.4-2ubuntu5.10 with Suhosin-Patch mod_ssl/2.2.8 OpenSSL/0.9.8g mod_perl/2.0.3 Perl/v5.8.8

Problem#3

A few options within the Apache configuration could have provided better security and not caused an information leak of your LAMP software.

Mitigation

Change the ServerToken option in the apache.config for the appliance.
To finish up I'm just going to point out a few more details I found when analyzing the Turnkey LAMP stack.

- phpMyAdmin is outdate and vulnerable to a number of remote attacks
- there is no firewall rules at all to protect the system
- root user login is allowed through SSH
- the root user for MySQL has no password

This should serve as a good indication that security and configuration of any LAMP stack should be taken seriously, regardless of whether you use a Turnkey product or not. I also want to not that I'm not out to get Turnkey Linux in any way, it just happens to be packaged nicely for analysis and widely used. You can also look at things like Red Hat,

which has an even older version of PHP in their repository!! If I ever get some time I'd like to start an open source project that provides a secure LAMP stack. This would provide system admins a hardened and secure platform to build upon and deploy web applications to.

2.1.2 LAMP Shines at Pfizer

Uses open source stack for web apps to get more out of its IT resources.

By Jennifer Mears, Network World | Network World US |*Published: 01:00, 08 August 2005*

Like many companies, Pfizer's Global Pharmaceutical Group is focused on creating applications that can be shifted and shared as services to get more out of IT resources, a so-called service oriented architecture.

While the New York drug company has been writing these web services using J2EE and .Net, it is now piloting an open source implementation from start-up ActiveGrid that it hopes will lower costs and improve scalability.

"The issue with J2EE based technologies is they're really tightly coupled to the application server stack and they have parallel or horizontal scaling issues," says Martin Brodbeck, director of application architecture at PGP. "With open source based technologies and the way in which ActiveGrid's product has been architected you get an elegant way to scale out applications using open source and the LAMP stack." The LAMP stack - Linux, Apache, MySQL, Perl, Python and PHP - is becoming an increasingly popular way in which to build web-based applications. In fact, one third of all websites are written using PHP, according to a Netcraft survey conducted late last year.

Big web companies such as Amazon, eBay and Google use architectures based on LAMP, but do a lot of custom coding to get the most out of open source. ActiveGrid intends to bring this kind of open source support for web services to the masses. At the O'Reilly Open Source Convention in Oregon last week, ActiveGrid unveiled the 1.0 version of its ActiveGrid Application Builder and its LAMP Application Server. Already, ActiveGrid has had 5,000 downloads of the early access version of its technology. The 1.0 releases add more enterprise features such as support for web services, says Peter Yared, a former Sun executive who founded ActiveGrid and is now its CEO.

"Companies like to use LAMP. The challenge has been that there isn't a lot of enterprise class, mission critical infrastructure out there to help you quickly and easily build applications and make them scale," says Anne Thomas Manes, vice president and research director at Burton Group. "When companies want to build really highly scalable application systems, in most cases they didn't have a choice. They had to go with .Net or J2EE. Now, with ActiveGrid, they have an alternative."

Companies like Amazon that build their own applications using LAMP have the engineering expertise to do it. "Most companies don't have supermen in house. They don't have the ability to do this on their own. ActiveGrid is saying, 'OK, here's a turnkey solution to make LAMP scale.' That's a wonderful thing," Thomas Manes says.

Brodbeck agrees. LAMP is less complex than J2EE or .Net, less costly and platform independent, he says. "It's just a really good architecture for developing robust and scalable applications than can run on any platform."

The ActiveGrid Application Builder 1.0 and the ActiveGrid LAMP Application Server 1.0 are available as free downloads from the ActiveGrid website under the Apache Software licence. They also are available with an annual maintenance and support contract.

A commercial version of the application server, which will add features such as identity server integration and dynamic data caching in return for an annual licence and support, is expected to be available soon.

2.2 Related work

2.2.1 e-Learning Solutions from Intel® Education Solution Providers

Intel® Learning Series Education Solution Provider (ESP) signifies an elite group of companies that meets rigorous requirements to plan and implement complete 1:1 eLearning solutions based on your local requirements and worldwide Intel® Learning Series best practices. ESPs are uniquely qualified to understand your education vision and to successfully deliver a full and sustainable eLearning solution that includes products, services, and support.

All ESPs have the expertise to anticipate and solve challenges while bringing together all the necessary components to ensure successful implementation:

- Consulting and guidance throughout the implementation process
- Technical and teacher training including security, storage and anti-theft measures
- A comprehensive network of ecosystem partners which provide tools and software to enable classroom collaboration, assessment, and project-based learning
- Hardware components (the classmate PC) specifically designed for the educational needs of students, featuring easy connectivity, educational software, and content
- Local relevance: all solutions are customized to fit local needs, and they are sold, distributed, and supported by local businesses.

2.2.2 LIQVID elearning services

LIQVID is based on two root words: '**Liq**uidus' - Latin for 'fluid' or 'flowing', and '**Vid**' - Sanskrit for 'to know'. Liquid, by definition, takes the shape of the mould. LIQVID's philosophy hinges upon the idea of personalized learning - learning that takes the shape of the learner. With Fortune 500 Clients and top Training Institutions across the world as its Partners, LIQVID is the fastest growing integrated eLearning content solutions company from-India.

LIQVID is specially known for its learning content development work in domains such as IT, Telecom, Publishing, and English Language Training (ELT). Based out of Noida, a suburb of New Delhi, India, LIQVID has world class infrastructure that delivers quality learning services that include Custom Content development, Training Design services, Technology Services, and Learning Support Services for Corporations, Academic Institutions and Government Organizations across the world.

LIQVID is a venture launched by key members of egurucool.com, which had established itself as India's foremost eLearning brands, created over 8,000 hours of eLearning content and had tied-up with over 1,600 schools. We, at LIQVID, pride ourselves on having gained reputation of being an eLearning company which matches global benchmarks and delivers rapid eLearning through cost-effective solutions. LIQVID is a preferred offshore vendor for Hewlett Packard (HP), USA and has executed several prestigious projects for organizations like Motorola, IBM, Hughes, American Express, BBC Learning, Harcourt, and Oracle.

CommLab India for effective learning

- CommLab India's eLearning Solutions:

After more than a decade in the eLearning space, CommLab India is in a position to offer you a complete range of services under one roof.

- ✓ **Create** instructionally sound eLearning courses ***fast***
- ✓ **Translate** eLearning into any of the **20 International** languages
- ✓ **Deliver** eLearning ***anywhere*** - computers, smart phones, iPads…
- ✓ **Manage** learning either on your LMS or on ours, ***24x7***

- Custom eLearning Solutions for Knowledge and Skill Development:

From the past 12 years, we have been developing highly engaging and interactive eLearning that help improve employee performance. Our courses have a strong instructional design foundation and go through a rigorous quality assurance processes to deliver training for achieving organizational results.

- ✓ Four level of interactivity to engage learners
- ✓ Rapid development using Flash, Lectora, Articulate and Captivate
- ✓ Customized training solutions for Product, Process, Compliance and HR
- ✓ Solution for industry-specific training challenges

- eLearning Translation Services to Reach a Global Audience:

When your training programs need to be rolled out globally, CommLab can help you translate courses into more than 20 languages.

- ✓ **Translated courses** to multiply training reach.
- ✓ Audio narration in various languages
- ✓ Switchable templates for rapid course conversion

- Mobile Learning for Easy Access to Training:

With the new age …

- ✓ Byte-size learning modules to impart training
- ✓ Converting classroom/ eLearning content to mLearning
- ✓ Multilanguage training solutions
- ✓ Using HTML 5 for Multiple device compatibility

- Host and Manage Learning through Technology:

CommLab India integrates learning with a technology backbone to host and manage training.

- ✓ Design and Customize a Learning Management System to suit your need
- ✓ Quick hosting solution for selling training programs to end users.
- ✓ Administer and manage a Learning Management System
- ✓ Product Training Mentor - integrating Content, Technology and Service

Chapter 3 Problem Definition

The organization and its objectives have been affected in the following ways:

- Many a times the instructors are not available for query resolution on phone.
- Students have to visit the study centres to obtain information regarding fee and courses offered.
- Students have to visit the study centres to obtain the printed study material.
- Handling technical queries over telephone results in the wastage of time because instructors spend most of their time resolving similar queries for different students.
- Searching students account information in the records, which are maintained manually, is time consuming.
- Storing the printed course materials is neither economical nor environment friendly.

Think of a scenario wherein your business is unable to manage its organizational data. You want a solution to the comprehensive data flow taking place throughout your organization and you want this solution in double quick time. In cases like these, where a business or an organization cannot dedicate a lot of time to problem solving, the LAMP stack is the preferred platform for development. This is because developers can build an application quickly and ensure its reliability and stability. It's actually a win-win situation for both you and the developers. Both sides save time, and the well-defined development process ensures a highly efficient application.

Problem solving measures:

- Automate all the possible manual processes involved using web development technologies such as PHP (As in the current case)
- They need an application that can be easily integrated into their existing IT infrastructure
- Creation of applications that can be trusted to deliver a high performance.

Chapter 4 Literature Survey

4.1 LAMP Platform

An acronym for the principal components combined to build a viable, general purpose web server, LAMP represents the individual solutions of Linux, Apache HTTP Server, MySQL and PHP (sometimes Perl or Python).

The software combination included in a LAMP package may vary, particularly when dealing with web scripting software. PHP, although being the most common component, may still be substituted by Perl and/or Python.

These programs were not originally designed to be integrated with one another but the philosophy and tool sets behind the development process were shared and developed in close conjunction. The LAMP software combination is most popular because of its zero dollar price tag, its open-source nature, and easily adaptable features. The LAMP stack is commonly bundled with most current Linux distributions.

4.2 Linux

Linux

Linux is a free, open-source, Unix-like computer operating system built on the core component of the Linux kernel. Since its inception, Linux has been ported to more computer hardware platforms than any other operating system and is a leading operating system not only on servers but other significant systems such as mainframe computers and supercomputers. Today more than 90% of the 500 fastest supercomputers run some variant of Linux.

4.3 Apache

Apache

The Apache HTTP Server, or simply Apache as it is commonly referred to, is a web server software solution most notable for having played a key role in the initial growth of the World Wide Web. Apache has been ranked the most popular HTTP server software in use since April of 1996. In March 2012 it was estimated to serve up to 57.46% of all active websites and a further 65.24% of the top servers across all domains.

4.4 MySQL

The world's most used open source relational database management system, MySQL (pronounced "My S-Q-L" by some or "My Sequel" by others) is a server providing multi-user access to a number of databases. MySQL is utilized in some fashion or another by many large and well-known organizations such as TYPO3, Joomla, WordPress, phpBB, MyBB, Drupal, Wikipedia, Google, Facebook, and Twitter.

4.5 PHP, Perl, or Python

A general-purpose server-side scripting language, PHP was initially engineered for serving dynamic web pages. Rather than calling an external file to process data, PHP was one of the first server-side scripting languages to be embedded into an HTM L source document. Since its early start PHP has evolved to include command-line interface capabilities and standalone graphical applications. Although PHP is used primarily in a LAMP solution, Perl and Python can often be substituted.

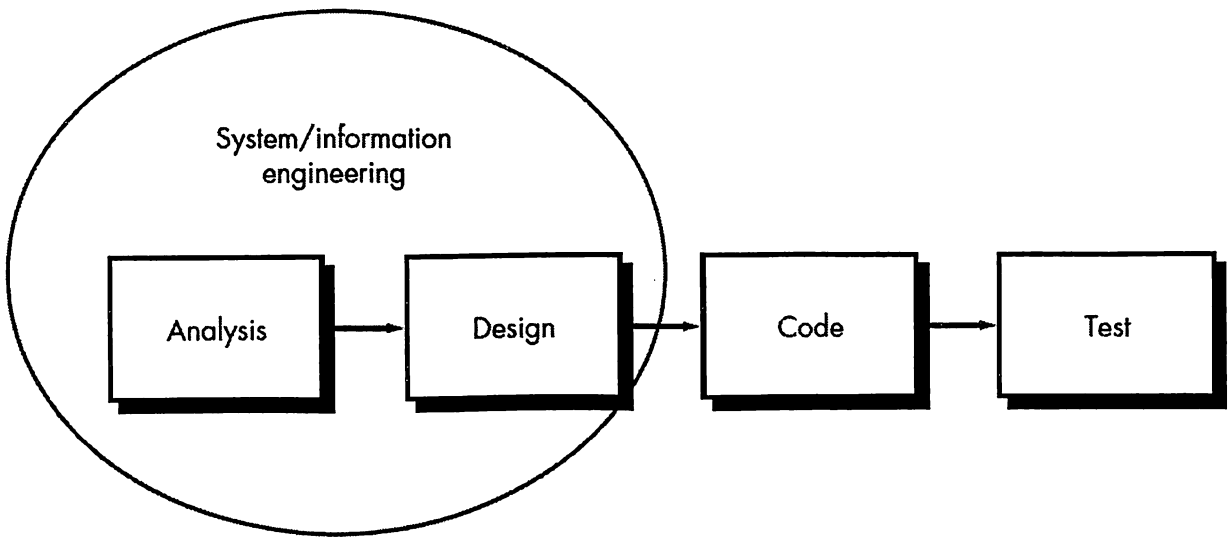
4.6 PhpMyAdmin

phpMyAdmin is a very famous MySQL mangement software package. To use it you should install and configure PHP, Apache and php mysql (or mysqli) extension see ApacheMySQLPHP for instructions.

Chapter 5 SYSTEM REQUIREMENT SPECIFICATION

5.1 Overall Description

Project Execution Plan



5.1.1 Product Perspective

In order to develop the e-learning site, you need to analyse the existing system and the envisioned system and create the application accordingly. The new system can be designed by using 3-tier architecture consists of following tiers:

Presentation tier: this layer consists of web forms. The forms can be used for accepting the data and displaying the final results to the users. In addition, It can be used to view information according to the requirements of users.
Business logic tier: this layer contains the code to provide the logic to create the e-learning site.
Data tier: this layer consists of the SQL Server 2005 database to store the relevant data related to students, instructors and course material.

LAMP is an Open web application platform, where there's choice and flexibility as to which component is selected. LAMP is an acronym for Linux-Apache-MySql-PHP. These components can be combined to produce a complete open source web server, database and web programming solution. While each of the components is an individual open source project, they are easily incorporated into a single server environment.
These packages are readily available online and can be installed on any Linux distribution either separately as individual components or in the following manner which is like a standard:

The apache and PHP software are programs are usually loaded together, using installation software packages designed for specific Linux distributions.
The MySql software is a separate installation package that is also available in the Linux distributions. Installing the three packages on Linux server is as easy as running the native software installation program for your distribution.

5.1.2 Product Features

PROPOSED SYSTEM

Based on the key observations of the management, it has been decided to develop an e-learning site for Fast Learn. The following decisions have been taken for developing the e-learning site.

- The site will store all data maintained for the existing system in a single centralized database. The database will contain the following information:

  - ✓ Student details
  - ✓ Faculty member details
  - ✓ Student queries and their solutions
  - ✓ Student feedback
  - ✓ Course information

- The site will provide course contents to the students in electronic form.
  All information including course details, fee structure, and notices for students will also be displayed on the site.

- The website will be used by three different types of users: Students, Instructors, and Administrators. The website will provide a different interface for each of the three types of users.

- Each user will be provided with a user name and password to log on to the site. Each user name will be mapped to one of three roles: Student, faculty, or Administrator. When a user provides his/her user name and password to log on to the website, then depending on the role of the user, the appropriate interface will be shown to the user.

The major functionalities of the proposed system are:

- The integrated web server can be configured to become active at the system start up, so the web service experience is available as early as possible.
- Using Apache Server helps to achieve two modes of service (server) accessibility,
  - ✓ As the normal user.
  - ✓ As the Admin.
- The Server provides the authentication check for whomsoever is trying to access the admin page (part of the web service) and allow access to only the person having the Admin credentials (assuming that the person involved is genuine).
- You can use the database functionality in the following two manners:
  - ✓ PhpMyAdmin (A LAMP based application) to administer, manage modify your database server features.
  - ✓ Using command line interface, provided by the TERMINAL.

Can manually manage who can view the contents of the file directory being used for web development.
Apart from using Apache's generic configuration file to start the Apache server, you can have customized configuration files for your environment, by working with **VIRTUAL HOSTS.**

5.1.3 User Classes and Characteristics

The system under discussion can be setup by any one including some enterprise level server-side administrator, web-developer or even a project enthusiast for that matter.
Now where this does leads us. This leads us to a point of conclusion that, after having the LAMP System fully functional, the web services deployed on the system can be used by any one looking to serve the purpose.
From the system worked out as the project, the following categories of users have a defined way of accessing the web service:

- Student: can be an old or a new one going for a fresh registration.
- Administrator: An Administrator is the only actor involved who has been granted the privilege of having access to the admin part of the web-service.
- Instructor: an instructor will play the same role as before just with the difference of doing it using the current service.

5.1.4 Operating Environment

The Linux based system should be present for assembling the different components of the LAMP Stack. In case new LAMP based application in freshly downloaded, then the native system should be equuipped with atleast the basic LAMP components required, and further availability depends upon the requirement.

5.1.5 Assumptions and Dependencies

Some of the factors that can impact our software directly or indirectly are:
All the components involved in the LAMP stack are free of cost. The day these components decide to go commercial, the integration and development will become an expensive one.

The user must be aware about the file distribution system, once the stack is within the system for the following two reasons:

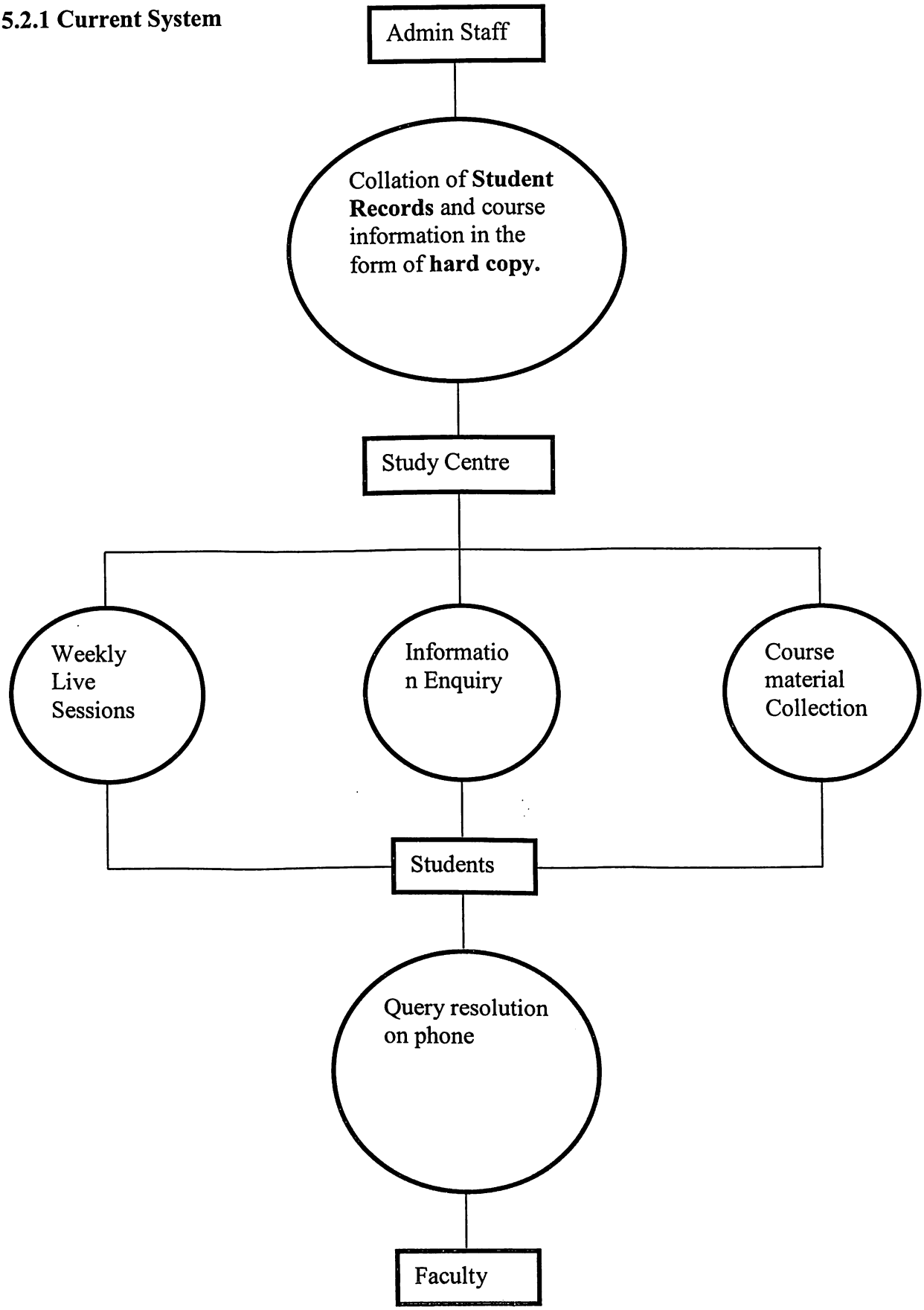
1. The up gradation of the web service or any of the server components may involve much consideration that requires in-depth knowledge about the system locations of each associated files.

2. The uninstallation or up gradation of the platform components must keep all the possible dependencies into consideration.

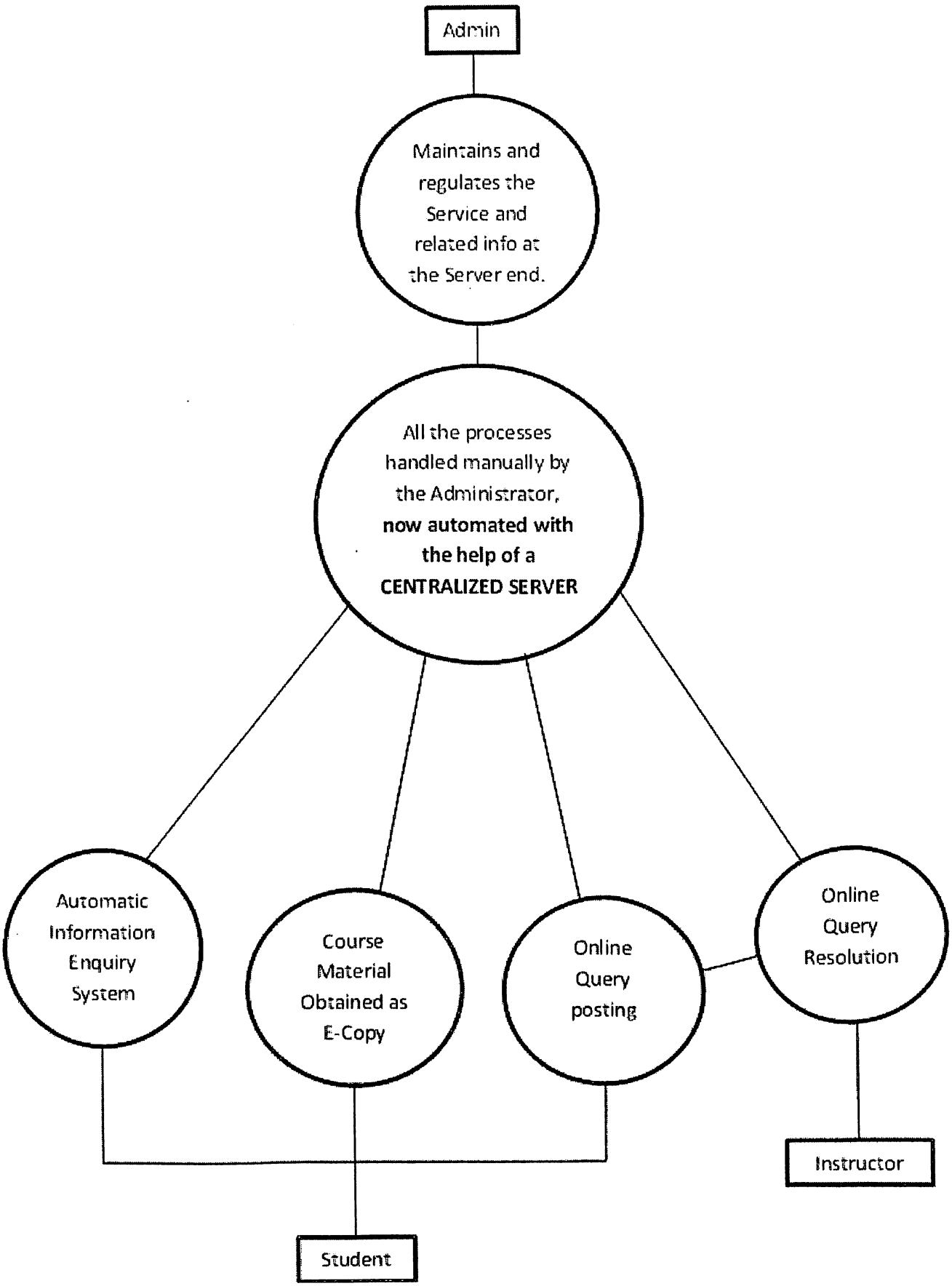
The personnel trying to access the admin part of the web service must be an admin. The network should be at least minimum of 256Kbps for smooth functioning.

5.2 System Features (Procedures Involved)

5.2.1 Current System

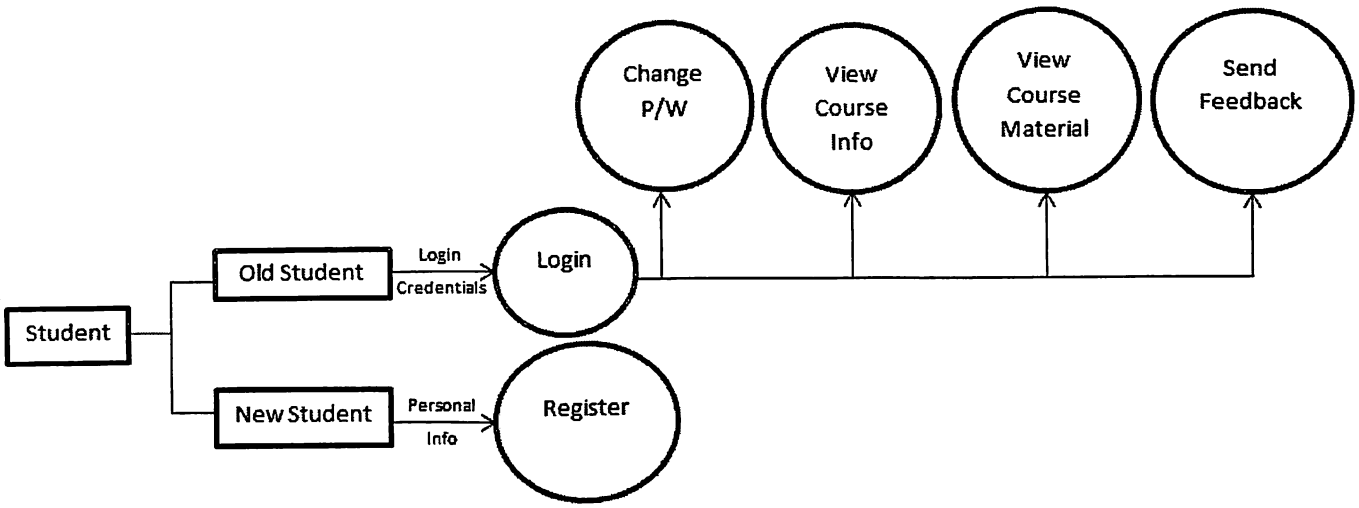


5.2.2 Context Diagram for the Proposed System

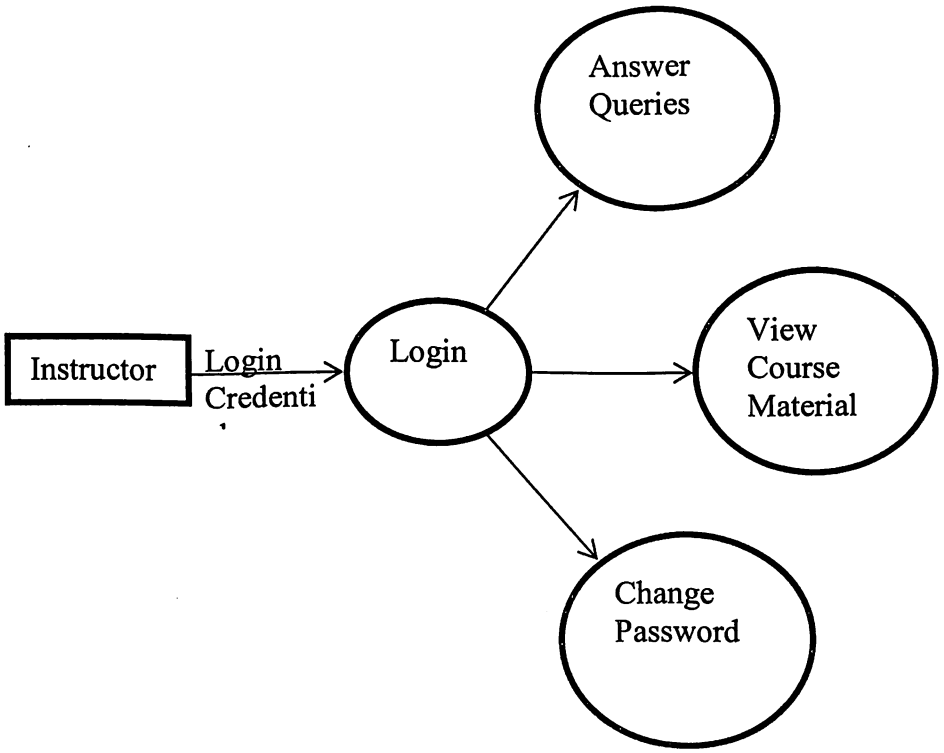


Data Flow Diagrams (DFD) - Level 0

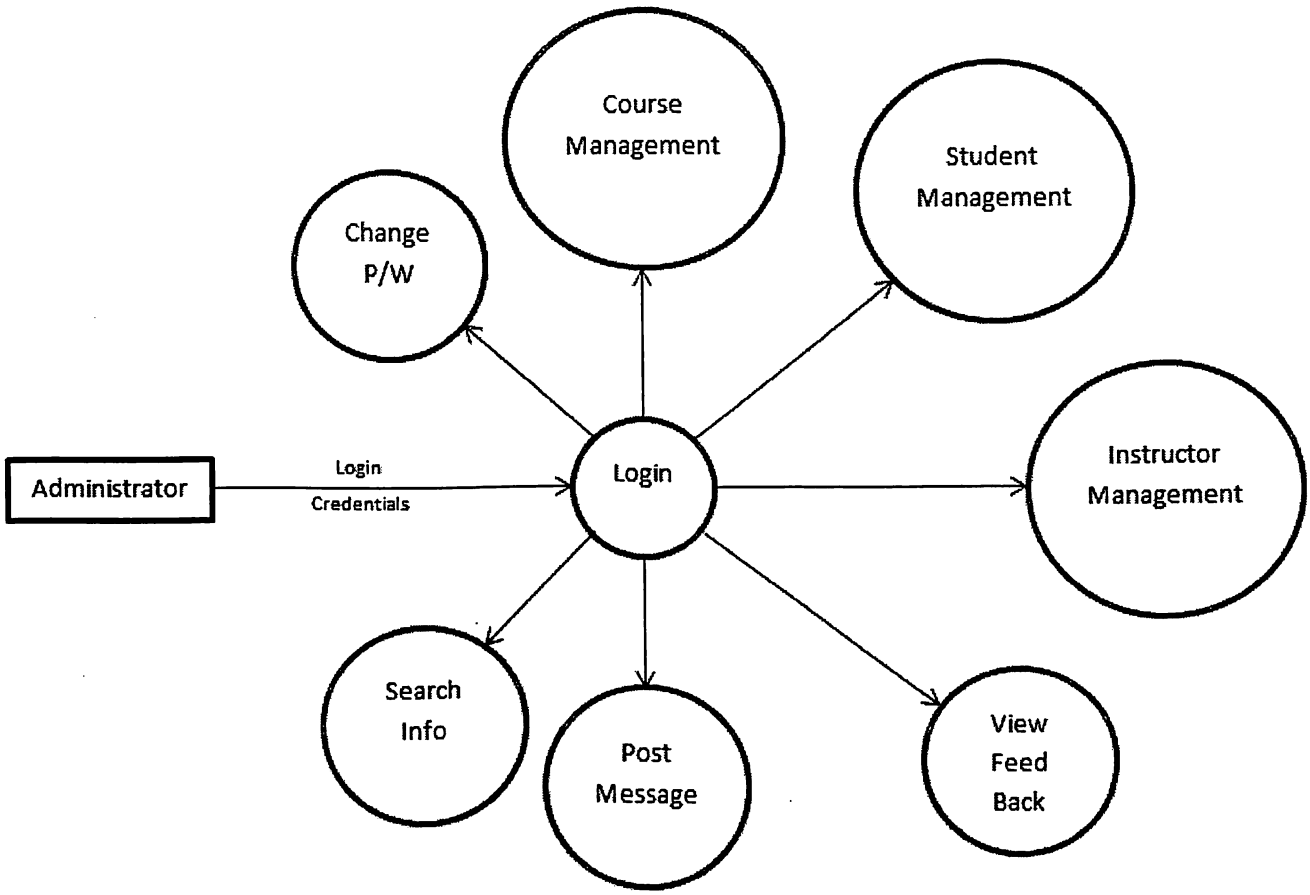
From Student's perspective



From the Instructor's perspective

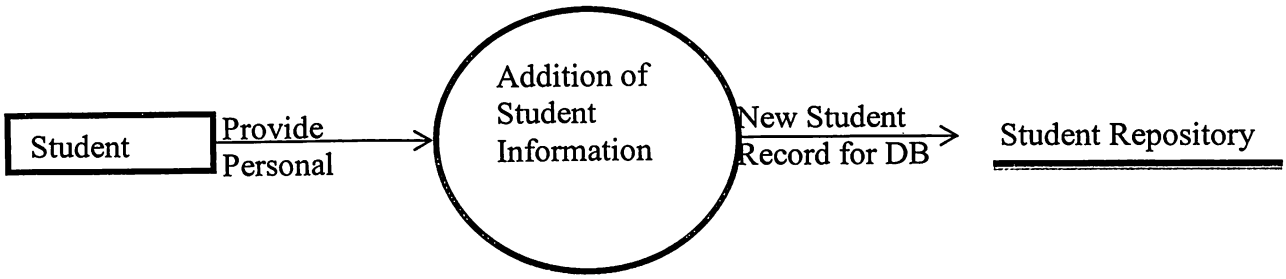


From Administrator's perspective

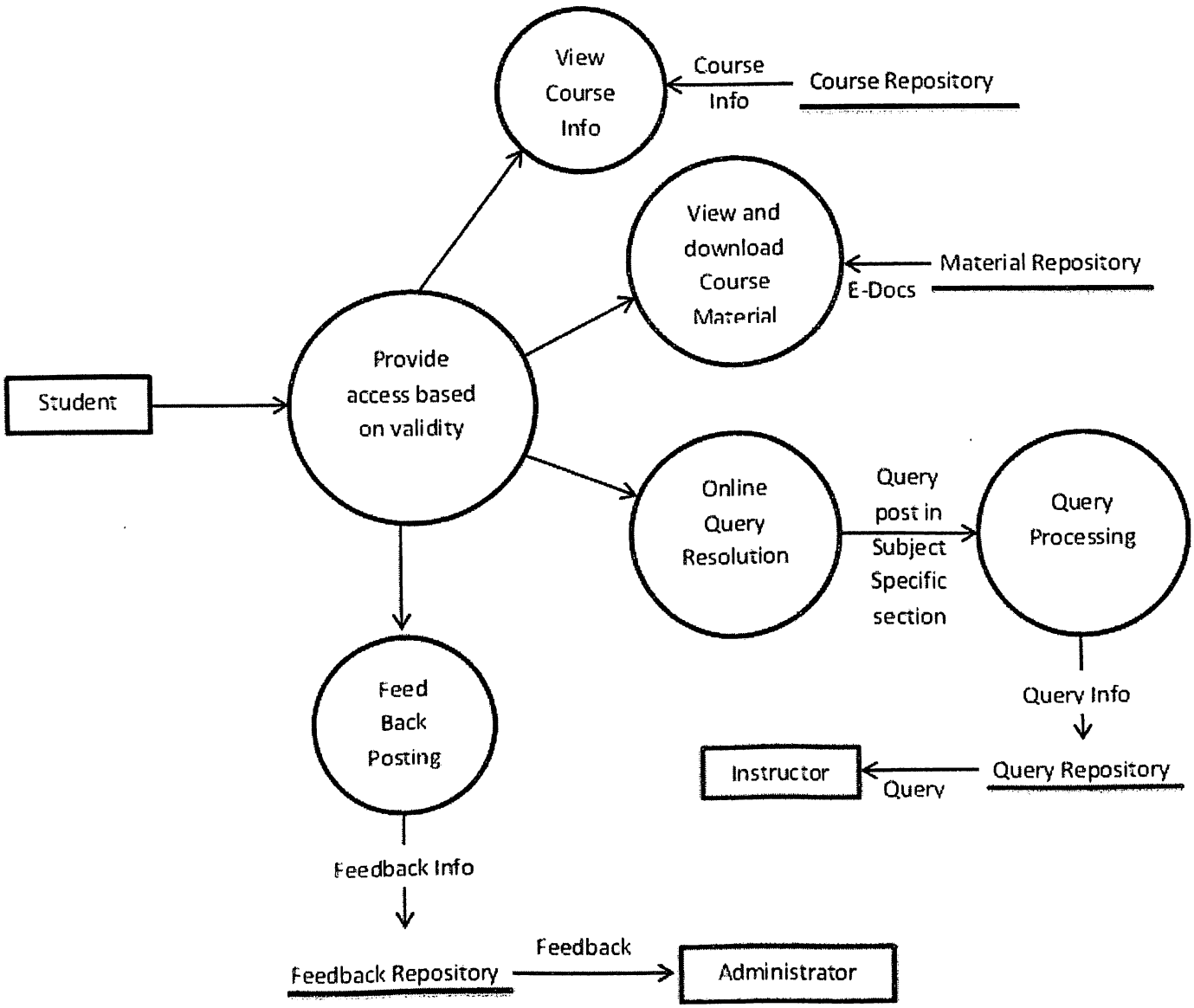


Data Flow Diagrams (DFD) - Level 1

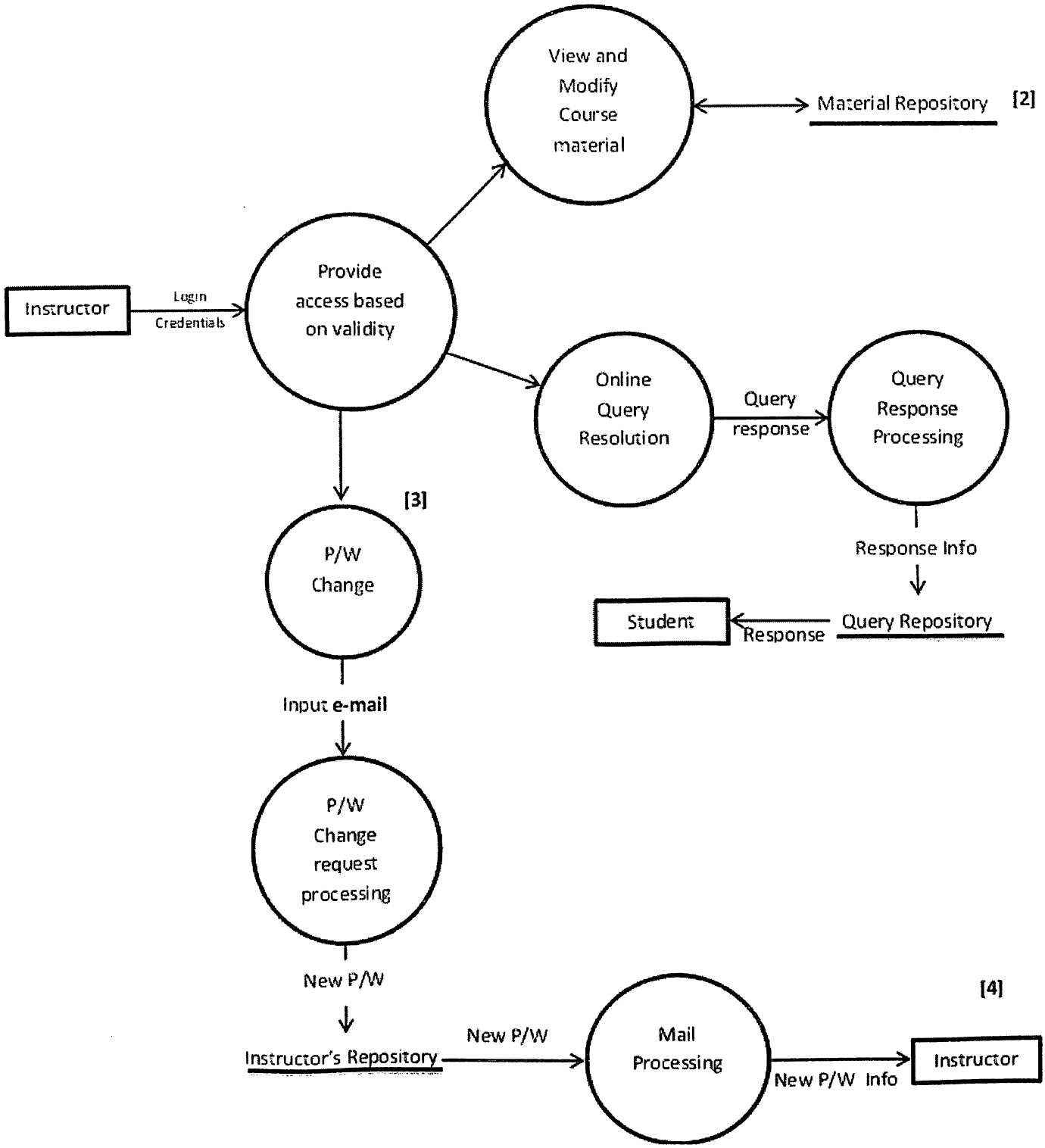
In case of a new Student



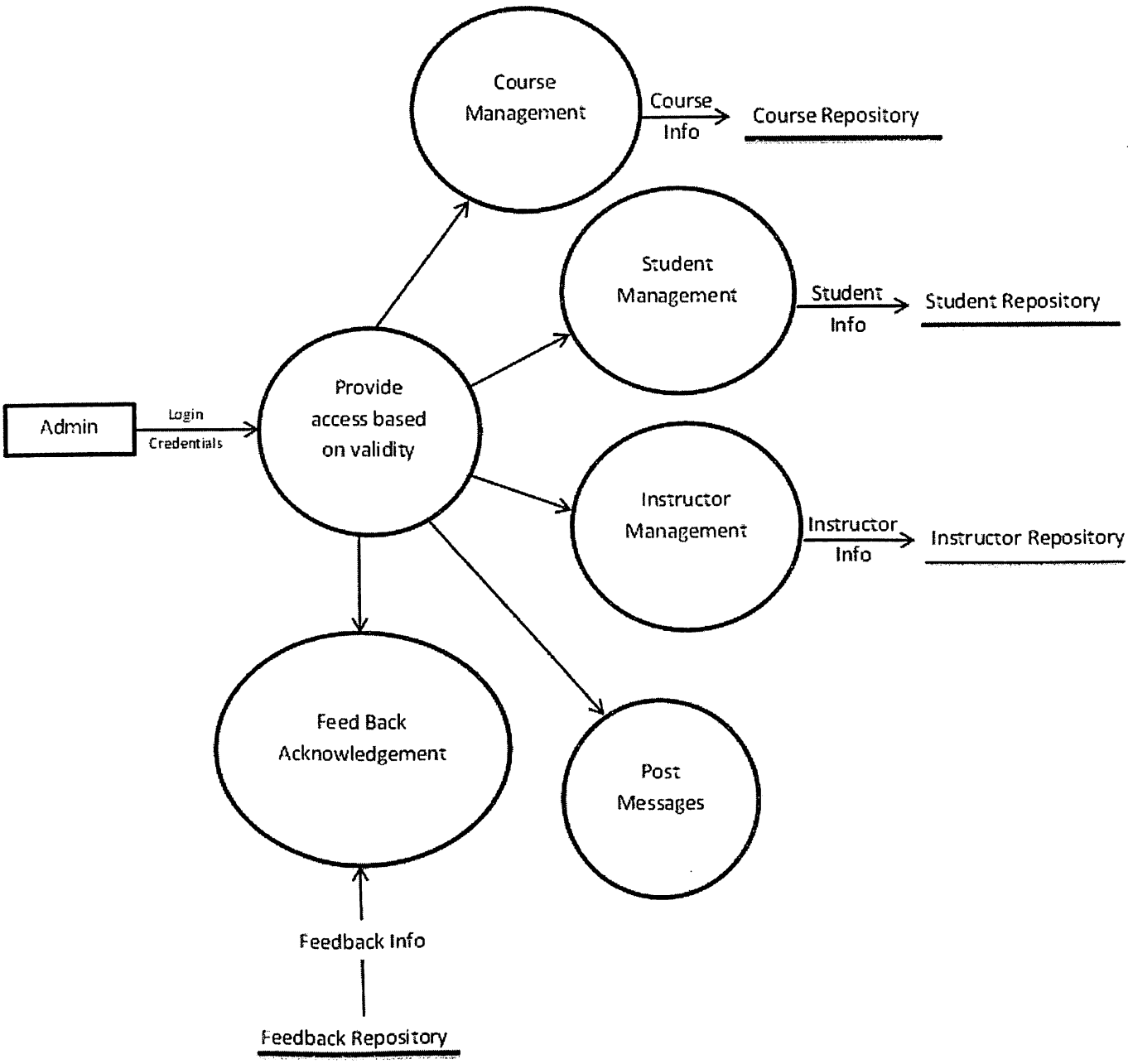
In case of an old Student



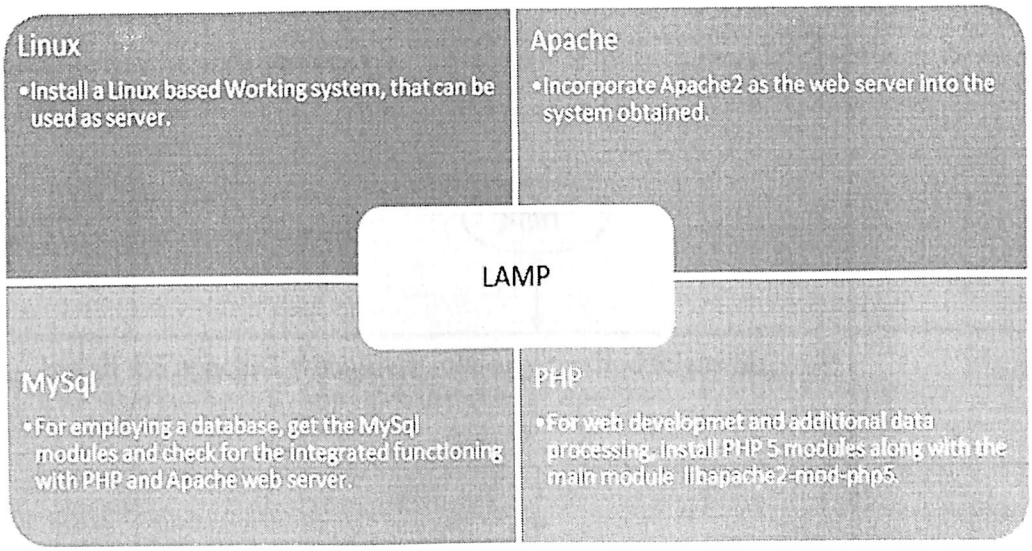
In case of the Instructor



In case of the administrator



5.3 System Integration



The Required components, as discussed before, can either be installed discretely, or as a package in the following way:

First install tasksel...

```
$ sudo apt-get install tasksel
```

... And then the LAMP stack:

To remove the LAMP stack remove the following packages:
Note: This assumes you have no other programs that require any of these packages. You might wish to simulate this removal first, and only remove the packages that don't cause removal of something desired.

```
apache2 apache2-mpm-prefork apache2-utils apache2.2-common libapache2-
mod-php5 libapr1 libaprutil1 libdbd-mysql-perl libdbi-perl libnet-
daemon-perl libplrpc-perl libpq5 mysql-client-5.5 mysql-common mysql-
server mysql-server-5.5 php5-common php5-mysql
```

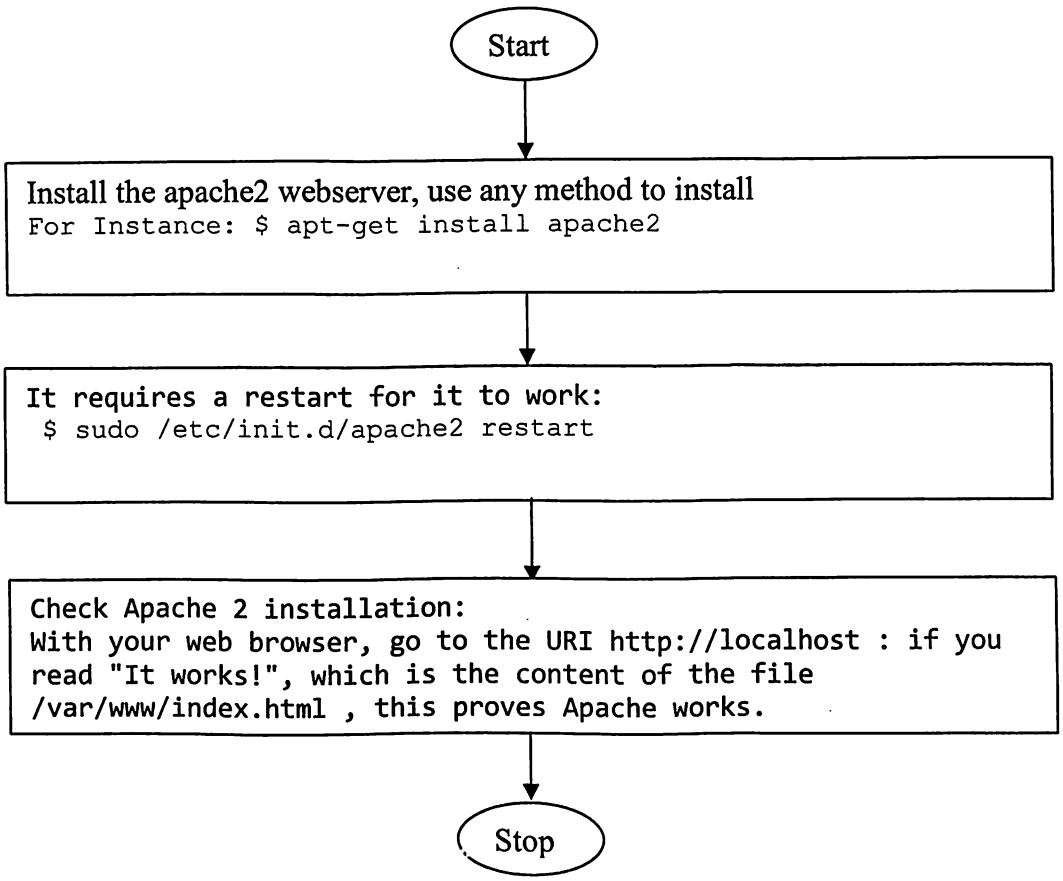
To also remove the debconf data, use the purge option when removing. To get rid of any configurations you may have made to apache, manually remove the /etc/apache2 directory once the packages have been removed.

You may also want to purge these packages:

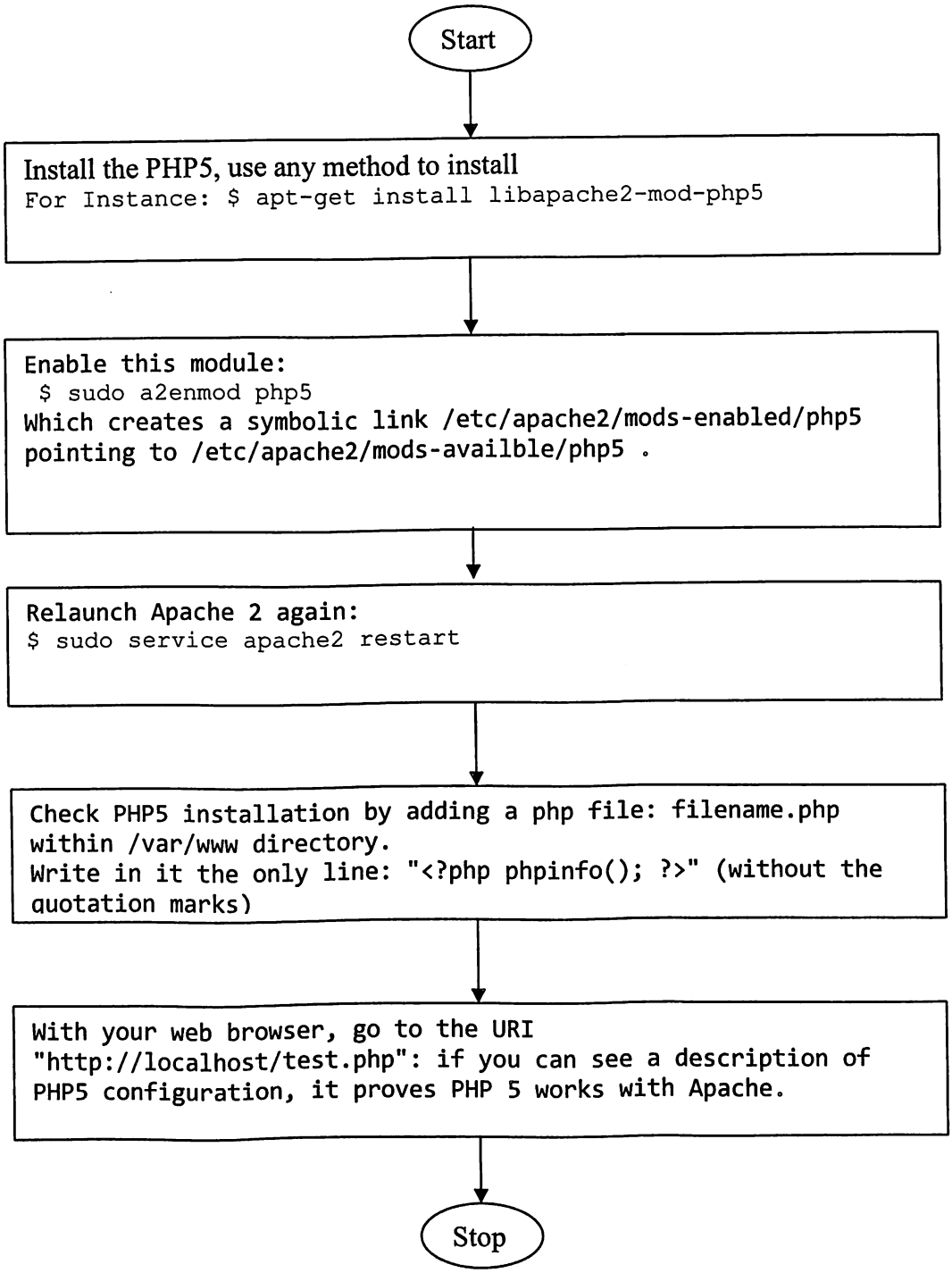
```
mysql-client-core-5.5 mysql-server-core-5.5
```

5.4 Step-Wise enlisting of the procedures involved

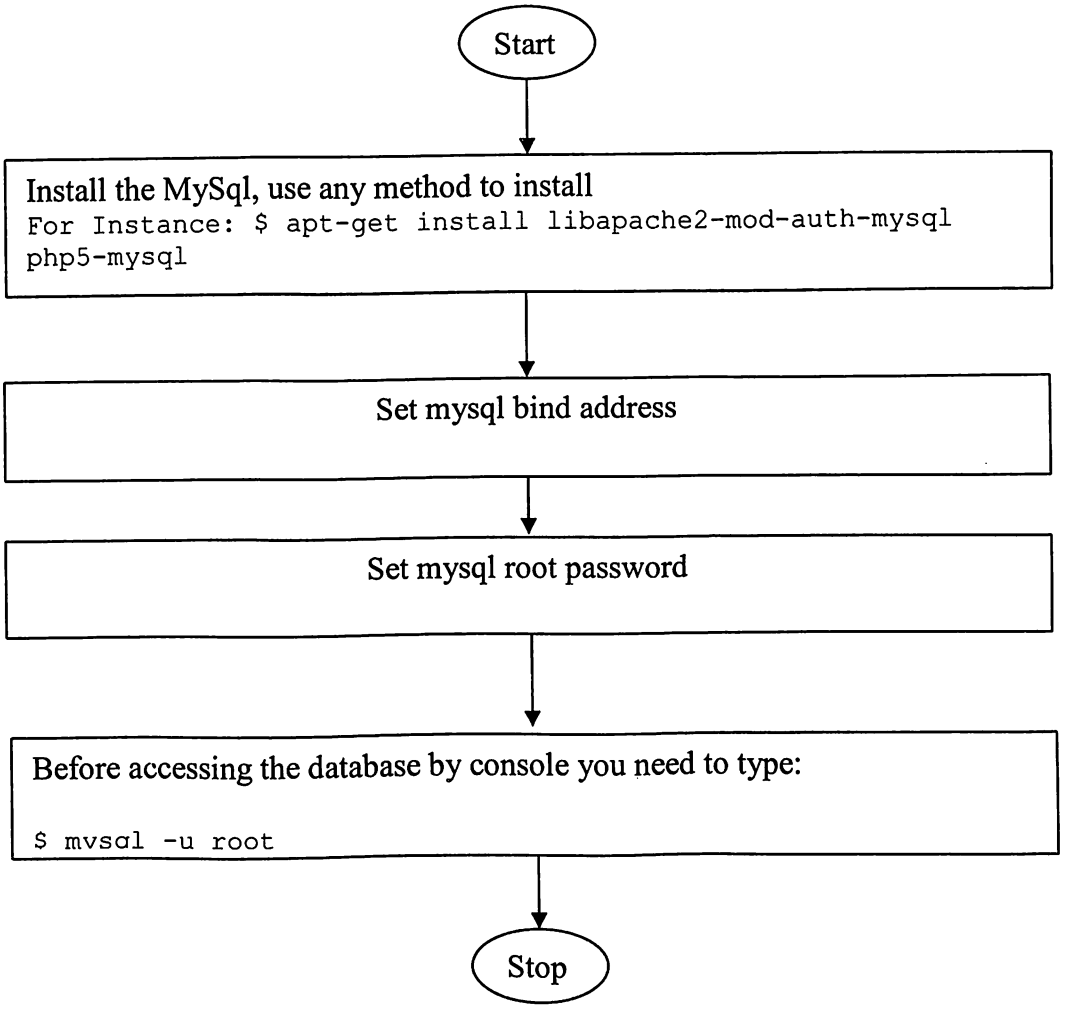
a). Installing Apache web server.



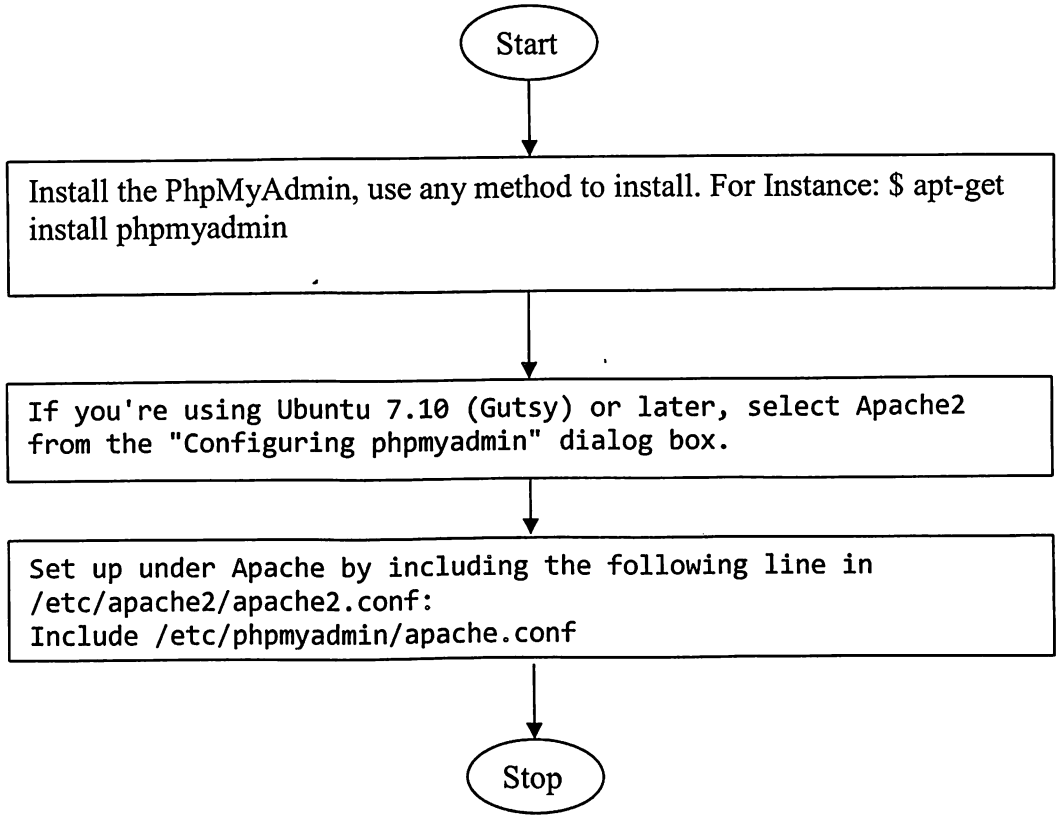
b). Installing PHP 5



c). Installing MySql with PHP5



d). Installing phpmyadmin



5.5 External Interface Requirements

5.5.1 User Interfaces

The interface for the student will provide the following facilities:

- View course information:

This feature will allow a student to search for a course and view information about the courses offered by the institute.

- Register for a course:

This feature will allow a student to register for a course.

- View course material:

This feature will allow students to access course materials for the courses to which they have been enrolled.

- Post queries:

This feature will allow students to send queries to their instructors and view the answers to their queries.

- Send feedback:

This feature will allow students to provide their feedback on the services offered to them.

- Change password:.

This feature will allow students to change the password for their login account.

This interface for the instructor will provide the following facilities:

- Answer queries:

This feature will allow instructors to view the queries of students and post answers for the same. Each instructor will be able to view the queries for only those subjects in which they specialize.

- View course material:

This feature will allow instructors to view the course material for the courses that they teach.

- Change password:

This feature will allow instructors to change the password for their login accounts.

The interface for the administrator will provide the following facilities to the administrators:

- Course management:

This feature will allow an administrator to add course information, such as course name, duration, prerequisites, and fee.

- Student management:

This feature will allow an administrator to add, edit, and block student accounts.

- Instructor management:

This feature will allow an administrator to add, edit, and block instructor accounts.

- View feedback:

This feature will allow an administrator to view the feedback received from students.

- Search information:

This feature will allow an administrator to all information related to students or instructors on the basis of their name, course, and study centre.

- Post message:

This feature will allow an administrator to display notices and messages on the website for the students.

- Change password:

This feature will allow an administrator to change the password for his/her login account.

The part where integration of the LAMP System is involved

With the integration of the LAMP Server, we require just Mozilla Firefox Browser, available by default with the Linux Distribution, for accessing the services used for testing purposes.
Apart from the basic web browser, the **Administrator** trying to access the **Admin** part of the Web Site may be prompted by the Authentication pop-up message asking the valid credentials.

5.5.2 Software Interfaces

The software interfaces that were required throughout the integration of the system were:

- The Terminal (Traditional UNIX tool)
- Vi Editor
- Phpmyadmin
- Gedit Text editor
- Mozilla Firefox Web Browser

5.6 Other Non-functional Requirements

5.6.1 Performance Requirements

Following performance related aspects are key ones to be mentioned:
The web server may be configured for automatically starting whenever the systems reboots. You may need to increase the memory limit that PHP imposes on a script. Edit the /etc/php5/apache2/php.ini file and increase the *memory_limit*value.

5.6.2 Security Requirements

Apart from employing the most crucial set of Security features, loaded with the Linux OS, the Apache Web Server can be configured to provide secure server access in the following ways:

- Apache Basic Authentication: To provide privileged access to the administrator only, the rights to access the admin parts of the web-service.

- Apache-SSL Authentication: This provides added security to the content being transferred by encrypting the data involved, as contrary to the method employed by the First One.

Chapter 6 System Design

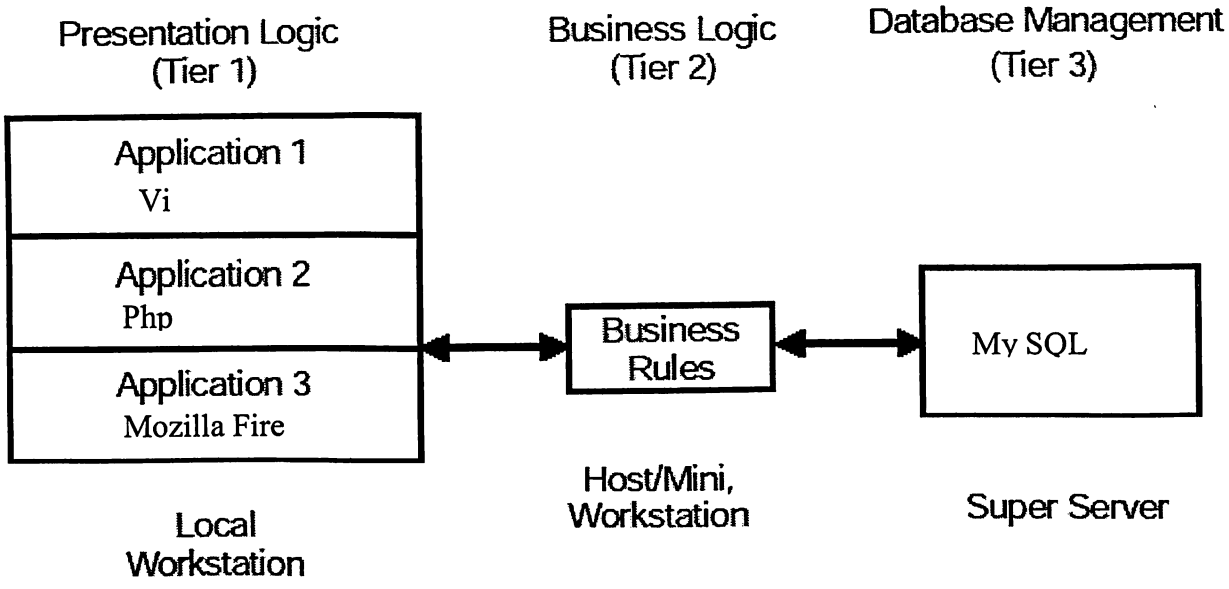


Fig: 6.1 – Three-tier architecture of the E-learning web service.

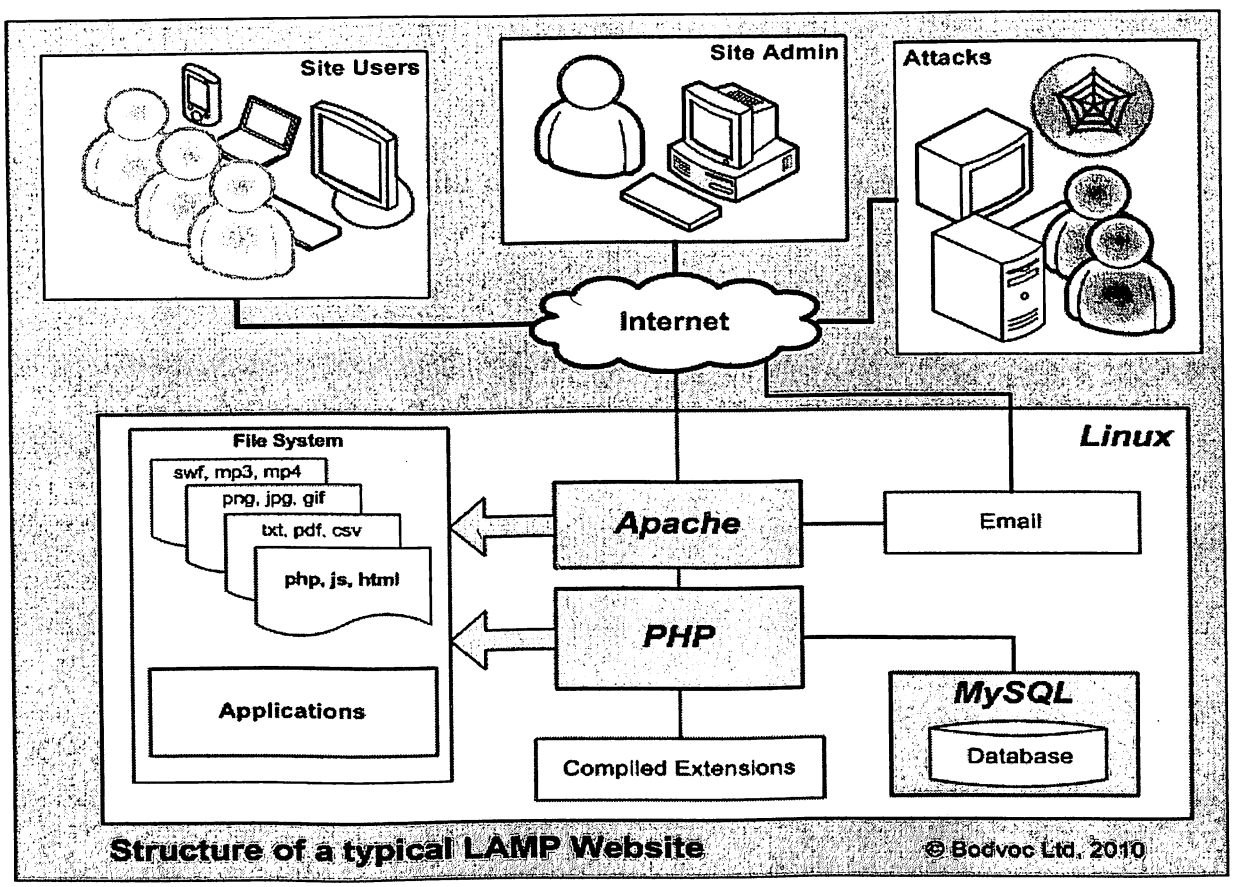


Fig: 6.2 - High-level Design

Chapter 7 Implementation

7.1 Implementation of the web service

- The web service front end was coded in **Php, HTML, CSS.**
- The business logic was coded using PHP.
- The Database Server uses MySql

Following are some relevant sections of code that were developed during the project.

7.1.1Web files location

```
root@ubuntu:/# ls
bin  boot  cdrom  dev  etc  home  lost  initrd.img  lib  lost+found  media  mnt  opt  proc  root  sbin  selinux  srv  sys  tmp  usr  var  vmlinuz
root@ubuntu:/# cd home/user/public_html
root@ubuntu:/home/user/public_html# ls
ad.php  major2  rough  test.php
root@ubuntu:/home/user/public_html# cd major2
root@ubuntu:/home/user/public_html/major2# ls
aboutus.php  banner.php  config.php  feedback.php  footer.php  header.php  index.php  left.php  login.php  logout.php  register.php  style.css
```

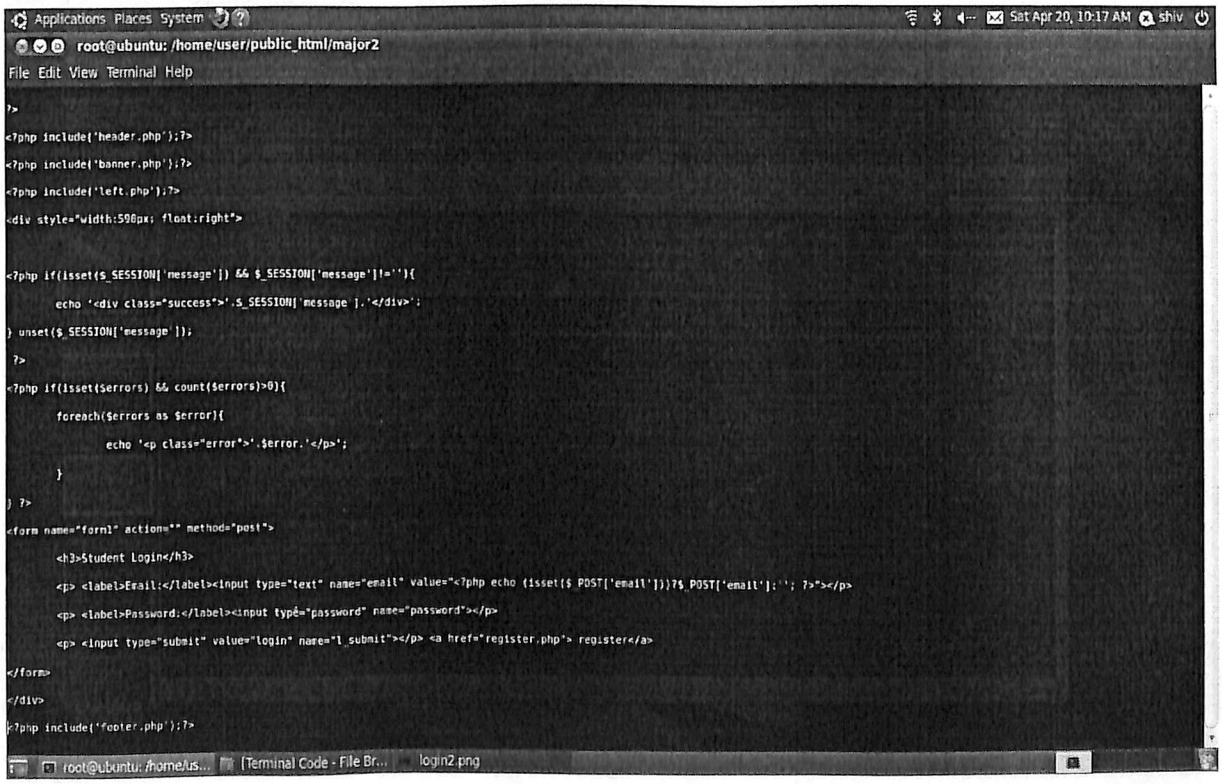
7.1.2 Login.php(1)

```
Applications  Places  System                                   Sat Apr 20, 10:15 AM  shiv
root@ubuntu: /home/user/public_html/major2
File  Edit  View  Terminal  Help
<?php include('config.php'); ?>

<?php

$errors=array();

$error=FALSE;

if(count($_POST)>0){


      if(!isset($_POST['email']) || trim($_POST['email'])==''){

            $errors[]='please enter email';

            $error=TRUE;

      }

      if(!isset($_POST['password']) || trim($_POST['password'])==''){

            $errors[]='please enter password';

            $error=TRUE;

      }




      if($error==FALSE){

            $sql="SELECT * FROM students_login WHERE email='".$_POST['email']."' AND password='".$_POST['password']."' LIMIT 1";

root@ubuntu: /home/us...   [Terminal Code - File Br...
```

7.1.3 Login.php(2)

```
        echo $sql;
        $result = mysql_query($sql);
        //print_r($result);
        $num_rows= mysql_num_rows($result);
        print_r($num_rows);
        if($num_rows>0){
        echo 'hi';
                $row = mysql_fetch_assoc($result);
                $_SESSION['is_logged_in']=true;
                $_SESSION['user_id'] = $row['user_id'];
                header('location:index.php');
        }else{
                $errors[]="Email or password is in correct";
        }
    }
}
```

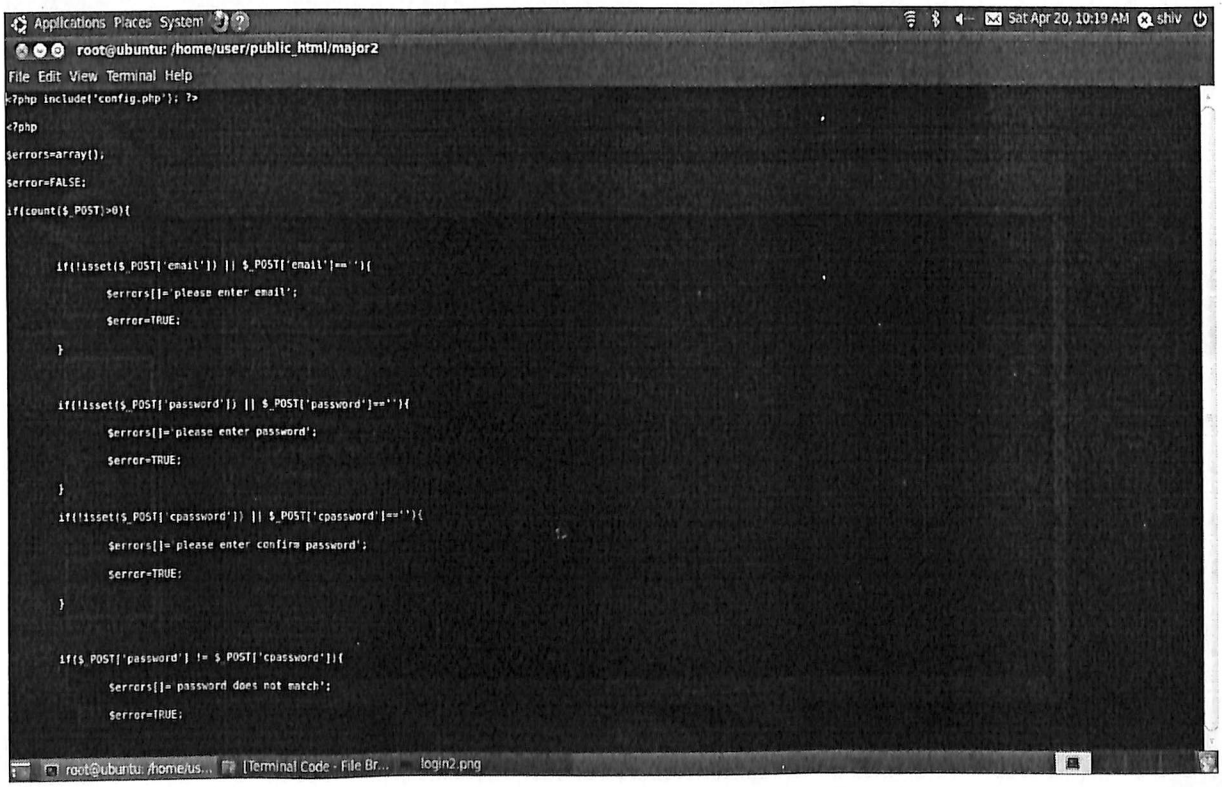
7.1.4 Login.php(3)



7.1.5 Logout.php

```
<?php session_start();
        $_SESSION['is_logged_in']=false;
        $_SESSION['username']='';
        $_SESSION['user_id']='';
        session_destroy();
        header('location:index.php');
?>
~
~
```

7.1.6 Register.php(1)



7.1.7 Register.php(2)

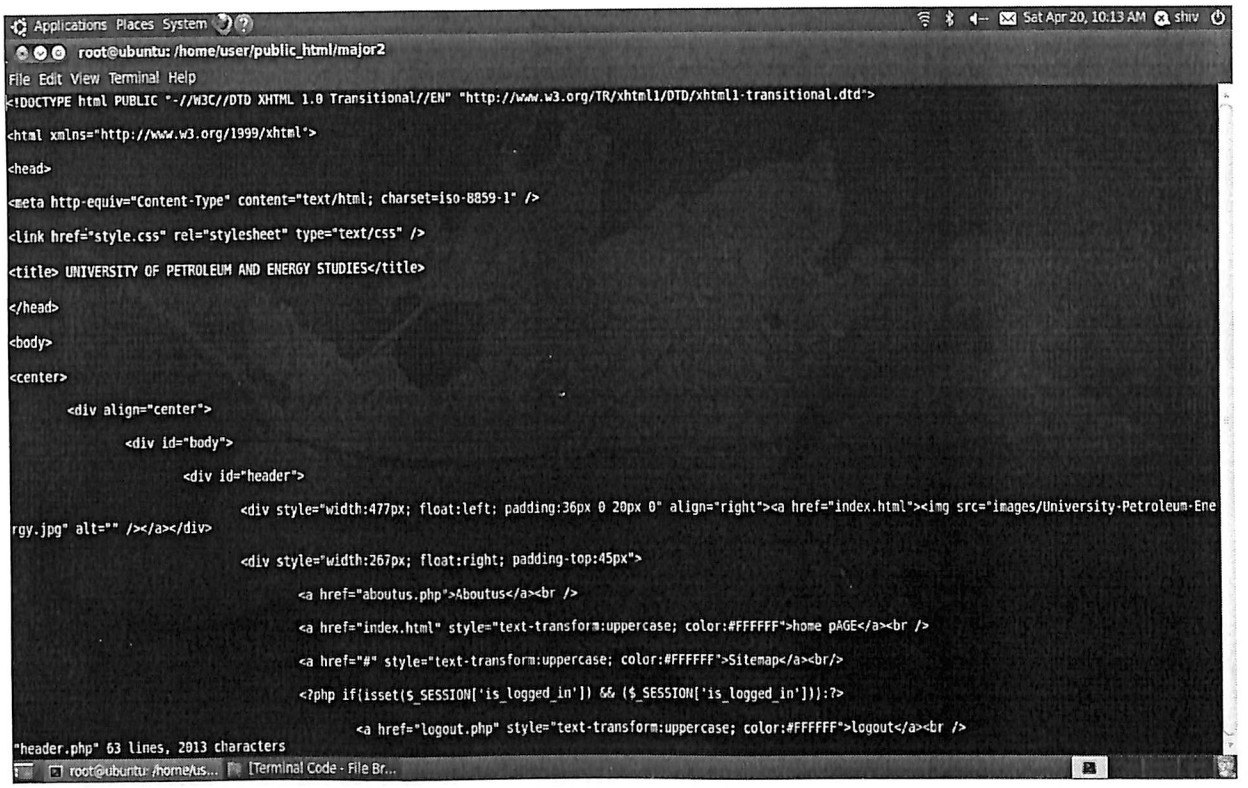
7.1.8 Register.php(3)

```
Applications Places System                                   Sat Apr 20, 10:19 AM  shiv
root@ubuntu: /home/user/public_html/major2
File Edit View Terminal Help
    |       ";
            $result = mysql_query($sql);
            $_SESSION['message']="Your account has been successfully created<br/>Plase login here";
            header('location:login.php');
      }


}

?>
<?php include('header.php');?>
<?php include('banner.php');?>
<?php include('left.php');?>
<div style="width:590px; float:right">
<?php if(isset($errors) && count($errors)>0){
      foreach($errors as $error){
            echo '<p class="error">'.$error.'</p>';
      }
} ?>
<form name="form1" action="" method="post">
      <h3>Student Registration</h3>

      <p> <label>Email:</label><input type="text" name="email" value="<?php echo (isset($_POST['email']))?$_POST['email']:''; ?>"></p>
```

7.1.9 Register.php(4)

```
      <p> <label>Password:</label><input type="password" name="password"></p>

      <p> <label>Confirm Password:</label><input type="password" name="cpassword"></p>

      <p> <label>Challan Number:</label><input type="text" name="challan_no" value="<?php echo (isset($_POST['challan_no']))?$_POST['challan_no']:''; ?>"></p>
      <p> <label>Enrollment Number:</label><input type="text" name="enrollment_no" value="<?php echo (isset($_POST['enrollment_no']))?$_POST['enrollment_no']:''; ?>"></p>

      <p> <input type="submit" value="Register" name="l_submit"></p>

</form>
</div>
<?php include('footer.php');?>
```

7.1.10 Header.php(1)

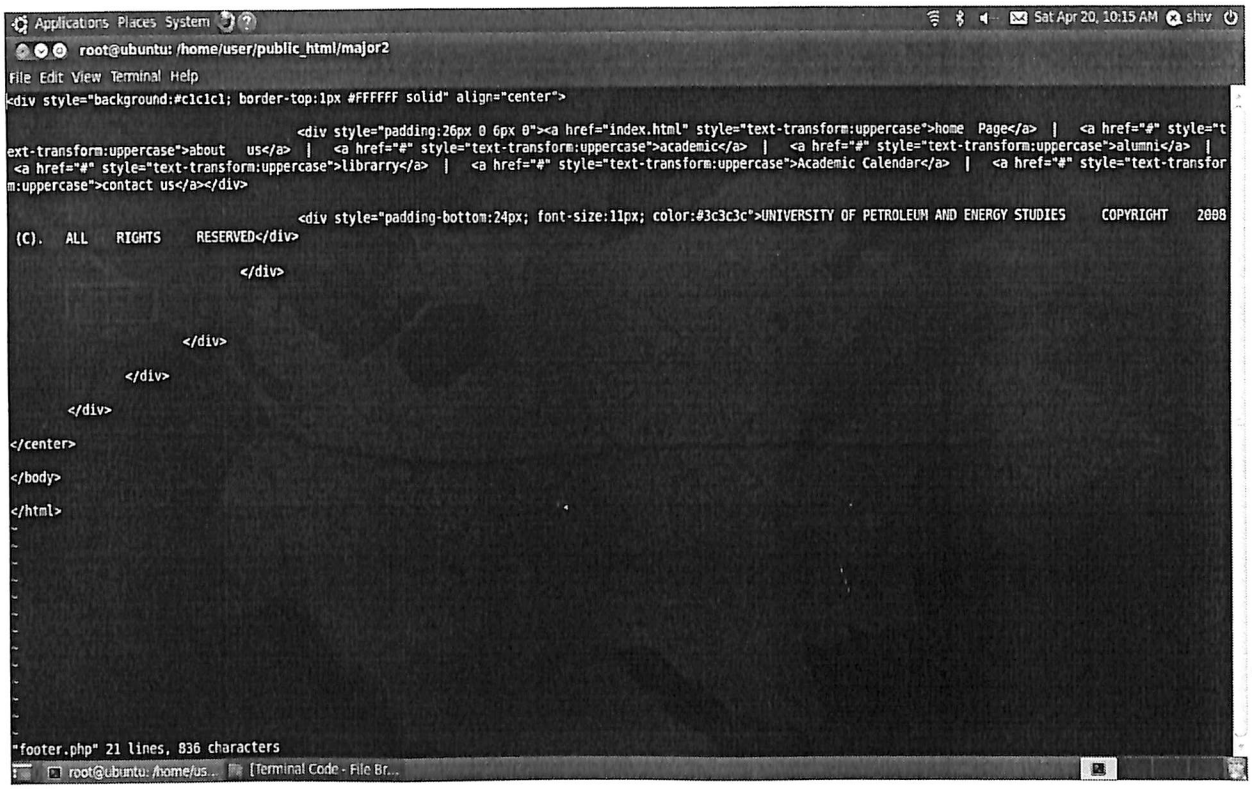


```
Applications Places System                                   Sat Apr 20, 10:13 AM shiv
root@ubuntu: /home/user/public_html/major2
File Edit View Terminal Help
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml">

<head>

<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />

<link href="style.css" rel="stylesheet" type="text/css" />

<title> UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</title>

</head>

<body>

<center>

        <div align="center">

                <div id="body">

                        <div id="header">

                                <div style="width:477px; float:left; padding:36px 0 20px 0" align="right"><a href="index.html"><img src="images/University-Petroleum-Ene
rgy.jpg" alt="" /></a></div>

                                <div style="width:267px; float:right; padding-top:45px">

                                        <a href="aboutus.php">Aboutus</a><br />

                                        <a href="index.html" style="text-transform:uppercase; color:#FFFFFF">home pAGE</a><br />

                                        <a href="#" style="text-transform:uppercase; color:#FFFFFF">Sitemap</a><br/>

                                        <?php if(isset($_SESSION['is_logged_in']) && ($_SESSION['is_logged_in'])):?>

                                                <a href="logout.php" style="text-transform:uppercase; color:#FFFFFF">logout</a><br />
"header.php" 63 lines, 2013 characters
root@ubuntu: /home/us...   [Terminal Code - File Br...
```

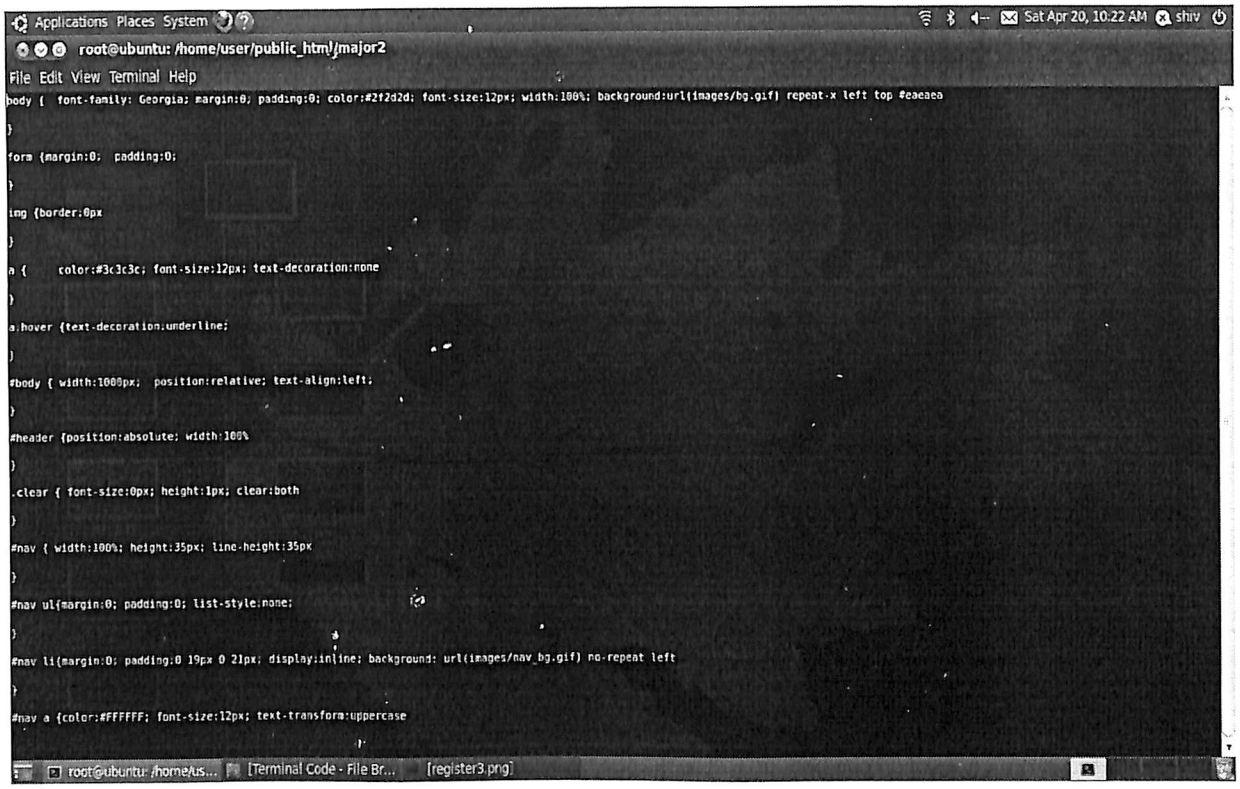
7.1.11 Header.php(2)

```
                                        <?php else: ?>

                                                <a href="login.php" style="text-transform:uppercase; color:#FFFFFF">Student login</a><br />

                                        <a href="register.php" style="text-transform:uppercase; color:#FFFFFF">Student register</a><br/>

                                        <?php endif; ?>

                                        <a href="feedback.php" style="text-transform:uppercase; color:#FFFFFF">feedback</a><br/>

                                        <a href="feedbackform.php" style="text-transform:uppercase; color:#FFFFFF">feedbackform</a><br/>

                                </div>

                                <div class="clear"><img src="images/spacer.gif" alt="" /></div>

                                <div id="nav">

                                        <ul>

                                                <li style="padding-left:86px; background:none"><a href="index.html">home  Page</a></li><li><a href="#">about  us</a></l
i><li><a href="#">academic</a></li><li><a href="#">alumni</a></li><li><a href="#">librarry</a> </li><li><a href="#">Academic Calendar</a></li><li><a href="#">contact us
</a></li>

                                        </ul>

                                </div>
```

7.1.12 Footer.php



7.1.13 Style.css



The implementation of the LAMP Integration is done in a modular fashion. This increases the reusability of the code as well the makes the project workout structured.

7.2 Installing LAMP Components

Virtual Hosts

Apache2 has the concept of sites, which are separate configuration files that Apache2 will read. These are available in /etc/apache2/sites-available. By default, there is one site available called *default* this is what you will see when you browse to http://localhost or http://127.0.0.1. You can have many different site configurations available, and activate only those that you need.

As an example, we want the default site to be /home/user/public_html/. To do this, we must create a new site and then enable it in Apache2.

To create a new site:

- Copy the default website as a starting point. sudo cp /etc/apache2/sites-available/default /etc/apache2/sites-available/mysite
- Edit the new configuration file in a text editor "sudo nano" on the command line or "gksudo gedit", for example:gksudo gedit /etc/apache2/sites-available/mysite
- Change the **DocumentRoot** to point to the new location. For example, /home/user/public_html/
- Change the **Directory** directive, replace <Directory /var/www/> to <Directory /home/user/public_html/>

You can also set separate logs for each site. To do this, change the ***ErrorLog*** and ***CustomLog*** directives. This is optional, but handy if you have many sites

- Save the file

Now, we must deactivate the old site, and activate our new one. Ubuntu provides two small utilities that take care of this: a2ensite (**apache2enablesite**) and a2dissite (**apache2disable site**).

$ sudo a2dissite default && sudo a2ensite mysite

Finally, we restart Apache2:

$ sudo /etc/init.d/apache2 restart

If you have not created */home/user/public_html/*, you will receive a warning message

To test the new site, create a file in /home/user/public_html/:

$ echo 'Hello! It is working!' > /home/user/public_html/index.html

Finally, browse to http://localhost/

After Installing MySQL

Set mysql bind address

Before you can access the database **from other** computers in your network, you have to change its bind address. **Note that this can be a security problem, because your database can be accessed by other computers than your own. Skip this step if the applications which require MySQL are running on the same machine.**

Type:

```
$ sudo nano /etc/mysql/my.cnf
```

and change the line:

```
bind-address = localhost
```

to your own internal ip address e.g. 192.168.1.20

```
bind-address = 192.168.1.20
```

If your ip address is dynamic you can also comment out the bind-address line and it will default to your current ip.

If you try to connect without changing the bind-address you will receive a "Cannot connect to MySQL error 10061".

Set MySQL root password

Before accessing the database by console you need to type:

```
$ mysql -u root
```

At the mysql console type:

```
$ mysql> SET PASSWORD FOR 'root'@'localhost' = PASSWORD('yourpassword');
```

A successful mysql command will show:

Query OK, 0 rows affected (0.00 sec)

Mysql commands can span several lines. Do not forget to end your mysql command with a semicolon.

Note: If you have already set a password for the mysql root, you will need to use:

```
$ mysql -u root -p
```

(Did you forget the mysql-root password? See MysqlPasswordReset.)

Configuration Module

This module focuses on the Authentication, Security and Customization aspects of the System.
Apache Basic Authentication
Apache offers the facility of "admin" site authentication, where the access to the admin part of the web site, requires user (admin here) to enter the credentials to pass through.
For having such functionality within a web site, following module is supposed to be added within the virtual host configuration file:
<Location "/admin">
AuthType Basic
AuthName "Administration Site"
AuthUserFile /etc/apache2/htpasswd
AuthGroupFile /etc/apache2/htgroup
Require group dvd-admin
</Location>

Well of course the files htpasswd and htgroup must be created within the directory specified.

7.2.1Installing Apache2

```
shiv@ubuntu:~$ su
Password:
root@ubuntu:/home/shiv# cd /
root@ubuntu:/# apt-get install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  apache2-mpm-worker apache2-utils apache2.2-bin apache2.2-common libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap libssl0.9.8
Suggested packages:
  apache2-doc apache2-suexec apache2-suexec-custom
The following NEW packages will be installed:
  apache2 apache2-mpm-worker apache2-utils apache2.2-bin apache2.2-common libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap
The following packages will be upgraded:
  libssl0.9.8
1 upgraded, 9 newly installed, 0 to remove and 521 not upgraded.
Need to get 6,375kB of archives.
After this operation, 10.2MB of additional disk space will be used.
Do you want to continue [Y/n]?
```

7.2.2 Installing Apache2-doc

```
root@ubuntu:/# apt-get install apache2-doc
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  apache2-doc
0 upgraded, 1 newly installed, 0 to remove and 521 not upgraded.
Need to get 2,280kB of archives.
After this operation, 12.5MB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu/ lucid-updates/main apache2-doc 2.2.14-5ubuntu8.10 [2,280kB]
Fetched 2,280kB in 2min 4s (18.3kB/s)
Selecting previously deselected package apache2-doc.
(Reading database ... 123300 files and directories currently installed.)
Unpacking apache2-doc (from .../apache2-doc_2.2.14-5ubuntu8.10_all.deb) ...
Processing triggers for doc-base ...
Processing 26 changed 1 added doc-base file(s)...
Registering documents with scrollkeeper...
Setting up apache2-doc (2.2.14-5ubuntu8.10) ...
 * Reloading web server config apache2
```

7.2.3 Installing PHP5

```
root@ubuntu:/etc/apache2# apt-get install php5 libapache2-mod-php5
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  apache2-mpm-prefork php5-common
Suggested packages:
  php-pear php5-suhosin
The following packages will be REMOVED:
  apache2-mpm-worker
The following NEW packages will be installed:
  apache2-mpm-prefork libapache2-mod-php5 php5 php5-common
0 upgraded, 4 newly installed, 1 to remove and 521 not upgraded.
Need to get 3,389kB of archives.
After this operation, 8,810kB of additional disk space will be used.
Do you want to continue [Y/n]?
```

7.2.4 Installing MySQL

```
root@ubuntu:/etc/apache2# apt-get install libapache2-mod-auth-mysql
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  libmysqlclient16 mysql-common
The following NEW packages will be installed:
  libapache2-mod-auth-mysql libmysqlclient16 mysql-common
0 upgraded, 3 newly installed, 0 to remove and 521 not upgraded.
Need to get 2,012kB of archives.
After this operation, 4,461kB of additional disk space will be used.
Do you want to continue [Y/n]? y
Get:1 http://us.archive.ubuntu.com/ubuntu/ lucid-updates/main mysql-common 5.1.66-0ubuntu0.10.04.1 [79.3kB]
Get:2 http://us.archive.ubuntu.com/ubuntu/ lucid-updates/main libmysqlclient16 5.1.66-0ubuntu0.10.04.1 [1,907kB]
Get:3 http://us.archive.ubuntu.com/ubuntu/ lucid/main libapache2-mod-auth-mysql 4.3.9-12ubuntu1 [25.6kB]
Fetched 2,012kB in 3min 6s (10.8kB/s)
Selecting previously deselected package mysql-common.
(Reading database ... 124920 files and directories currently installed.)
Unpacking mysql-common (from .../mysql-common_5.1.66-0ubuntu0.10.04.1_all.deb) ...
Selecting previously deselected package libmysqlclient16.
Unpacking libmysqlclient16 (from .../libmysqlclient16_5.1.66-0ubuntu0.10.04.1_i386.deb) ...
Selecting previously deselected package libapache2-mod-auth-mysql.
Unpacking libapache2-mod-auth-mysql (from .../libapache2-mod-auth-mysql_4.3.9-12ubuntu1_i386.deb) ...
Setting up mysql-common (5.1.66-0ubuntu0.10.04.1) ...
Setting up libmysqlclient16 (5.1.66-0ubuntu0.10.04.1) ...

Setting up libapache2-mod-auth-mysql (4.3.9-12ubuntu1) ...
Processing triggers for libc-bin ...
ldconfig deferred processing now taking place
root@ubuntu:/etc/apache2#
```

7.2.5 Installing PhpMyAdmin

```
root@ubuntu:/# apt-get install phpmyadmin
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  dbconfig-common javascript-common libjs-mootools libmcrypt4 libt1-5 php5-gd php5-mcrypt php5-mysql wwwconfig-common
Suggested packages:
  libmcrypt-dev mcrypt postgresql-client apache apache-ssl
The following NEW packages will be installed:
  dbconfig-common javascript-common libjs-mootools libmcrypt4 libt1-5 php5-gd php5-mcrypt php5-mysql phpmyadmin wwwconfig-common
0 upgraded, 10 newly installed, 0 to remove and 521 not upgraded.
Need to get 5,391kB of archives.
After this operation, 21.8MB of additional disk space will be used.
Do you want to continue [Y/n]?
```

7.2.6 Adding Virtual Host

```
root@ubuntu: /etc/apache2/sites-available
File  Edit  View  Terminal  Help
<VirtualHost *:80>
    ServerName test.example.com
    DocumentRoot /home/user/public_html/
    ServerAlias test www.test.example.com
    ErrorLog /var/log/apache2/error.log
    CustomLog /var/log/apache2/access.log combined



    <Directory "/home/user/public_html/">
      Options Indexes MultiViews FollowSymLinks
      AllowOverride All
      Order allow,deny
      Allow from all
      Allow from 127.0.0.1
    </Directory>
</VirtualHost>
```

7.2.7 Apache Basic Authentication

```
  DirectoryIndex test.php
 <Location "/admin">
   AuthType Basic
   AuthName "Administration Site"
   AuthUserFile /etc/apache2/htpasswd
   AuthGroupFile /etc/apache2/htgroup
   Require group dvd-admin
 </Location>
```

7.2.8 Configuring PhpMyAdmin

```
root@ubuntu:/etc/apache2# sudo ln -s /etc/phpmyadmin/apache.conf /etc/apache2/conf.d/phpmyadmin.conf
root@ubuntu:/etc/apache2# /etc/init.d/apache2 reload
 * Reloading web server config apache2
[Sun Dec 02 12:32:53 2012] [warn] The Alias directive in /etc/phpmyadmin/apache.conf at line 3 will probably never match because it overlaps an earlier Alias.
                                                                                                                                                    [ OK ]
```

7.3 Configuration Module

LogFile path and Working Directory settings

Following are the error log directory and working directories respectively:

ErrorLog /var/log/apache2/error.log
DocumentRoot /home/user/public_html/

7.4 Event Logging Module

All the application events will be logged to the log.txt file in the application directory. This functionality is achieved through the subroutine named,
CustomLog /var/log/apache2/access.log combined

7.5 List of commands

The following table provides a general overview on the various commands that the program can handle. The table briefs on purpose, system response and email response by the software.

Commands Used	Purpose
$ sudo /etc/init.d/apache2 restart	Reloading/Restarting apache2 web server.
$ sudo a2enmod php5	Enabling PHP5-Apache2 Module
$ sudo dpkg-reconfigure -plow phpmyadmin sudo ln -s /etc/phpmyadmin/apache.conf /etc/apache2/conf.d/phpmyadmin.conf	Trouble shooting Error 404 while accessing phpmyadmin from the browser
$ a2ensite <sitename>	Enabling a site
$ a2dissite <sitename>	Disabling a site
$ apt-get install <package name>	Installing a package
$ sudo tasksel install <package name>	Installing a complete packaged software
$ sudo nano /etc/apache2/conf.d/fqdn	Create a new file named fqdn
$ echo "ServerName localhost" | sudo tee /etc/apache2/conf.d/fqdn	Saving the content in the created file
$ mysql –u root –p	Accessing the mysql command line interface as root.

Table 7.1: Overview of commands that LAMP Server supports.

Chapter 8 Troubleshooting

Troubleshooting Approach

8.1 Troubleshooting Aapache2.

If you get this error:

```
apache2:Could not determine the server's fully qualified domain name, using
```

then use a text editor such as "sudo nano" at the command line or "gksudo gedit" on the desktop to create a new file,

$ sudo gedit /etc/apache2/conf.d/fqdn

or

$ gksu "gedit /etc/apache2/conf.d/fqdn"

then add

ServerName localhost

to the file and save. This can all be done in a single command with the following:

$ echo “ServerName localhost” | sudo tee /etc/apache2/conf.d/fqdn

8.2 Troubleshooting Aapache-php mod.

libapache2-mod-php5

Enable this module by doing

$ sudo a2enmod php5

which creates a symbolic link /etc/apache2/mods-enabled/php5 pointing to /etc/apache2/mods-availble/php5 .

Except if you use deprecated PHP code beginning only by "<?" instead of "<?php" (which is highly inadvisable), open, as root, the file /etc/php5/apache2/php.ini , look for the line "short_open_tag = On", change it to "short_open_tag = Off" (not including the quotation marks) and add a line of comment (beginning by a semi-colon) giving the reason, the author and the date of this change. This way, if you later want some XML or XHTML file to be served as PHP, the "<?xml" tag will be ignored by PHP instead of being seen as a PHP code mistake.

8.3 Troubleshooting Phpmyadmin

- **If you get blowfish_secret error:** Choose and set a phrase for cryptography in the file /etc/phpmyadmin/blowfish_secret.inc.php and copy the line (not the php tags) into the file /etc/phpmyadmin/config.inc.php or you will receive an error.

- **If you get a 404 error upon visiting** http://localhost/phpmyadmin**:** You will need to configure apache2.conf to work with Phpmyadmin.
  $ sudo gedit /etc/apache2/apache2.conf

- Include the following line at the bottom of the file, save and quit.

$ Include /etc/phpmyadmin/apache.conf
Alternative: install phpMyAdmin from source

Chapter 9 Conclusion

With the full fledge working of this web service, not only an organization like the one which is considered as a subject case in the current project, but also for those, who are actually dealing with the problems in the E-Education services.
The web service developed as the current project can be utilised as such a potential part of an organization which in some way or the other, intends on imparting education services online.
This project was done in fulfilment of the wish to create a web service using LAMP technology. It not only provides a solution to a preconceived problem occurring in the education industry but also, providing a better means of developing solutions for soft wares and information services in the form of LAMP Stack.

This project provides a simple foundation that will get us started with the core principles in LAMP System. LAMP is a huge subject, and I have only scraped the surface that is the LAMP system. The LAMP system is wonderfully flexible. Although I only covered a subset of the aspects involved in LAMP development, the concepts discussed here can give you a solid foundation that will prepare you to meander through the huge selection of LAMP tutorials and documentation scattered across the Internet.

The current obtained system can be used for further study into the subject and obviously for deploying various scalable and robust web services.

Chapter 10 Future Enhancements

After having a detailed and thorough workout on integrating the LAMP System, we are all set to further explore the functionality of this system by looking after the following aspects:

- This project can lead to the exploration into to the field of E-Learning consulting.
- The website should validate the user's name and password before allowing the user to log on to the website.
- If the user leaves the website idle for more than 5 minutes, then his or her session should be expired and the user should be asked again to log in.
- The retrieval of the data should be fast so that the user does not have to wait for the data to be displayed for long. In addition, while the data in a part of the page is being displayed, the user should be allowed to interact with the rest of the Web page.
- The users should be allowed to personalize the website according to their preferences.
- The user interface of the website should be appealing, easy to understand and access, and consistent. The font size be large enough so that it can be easily read by people with diminished vision. The colours used in the website should not be right and dark.
- Testing the Interoperability between windows and Linux applications using the SAMBA Server.

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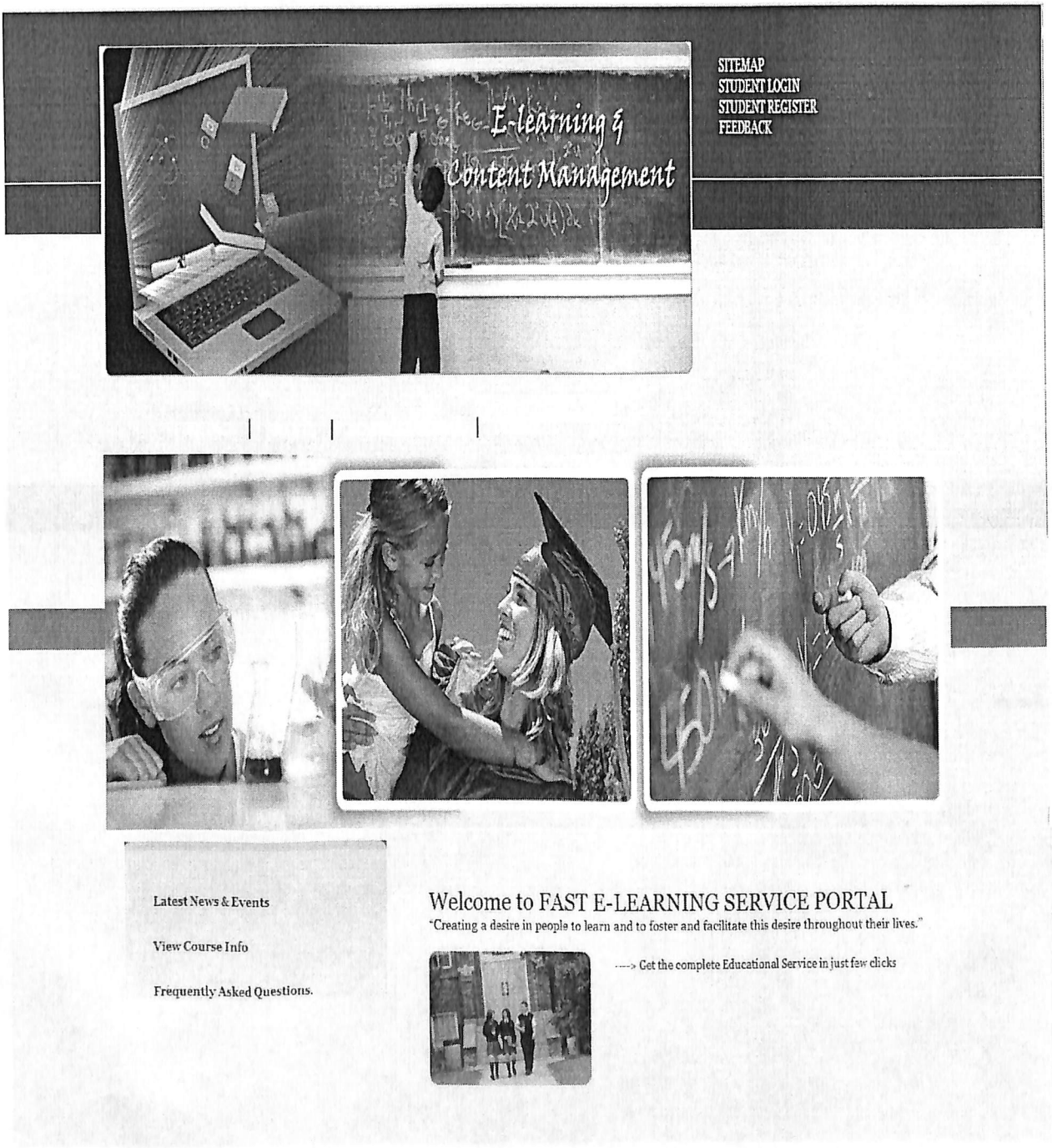
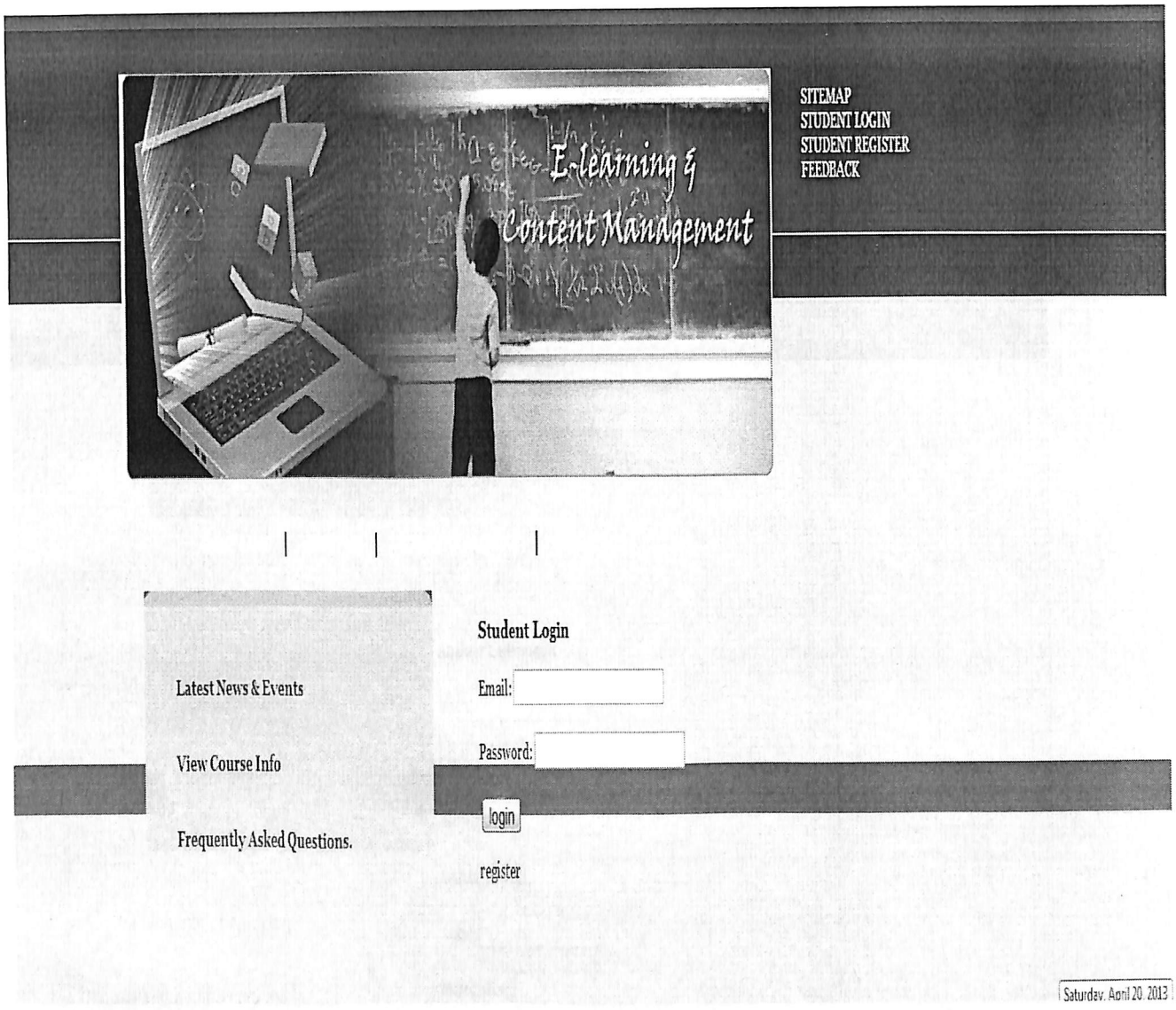
APPENDIX – Sample Screen Prints

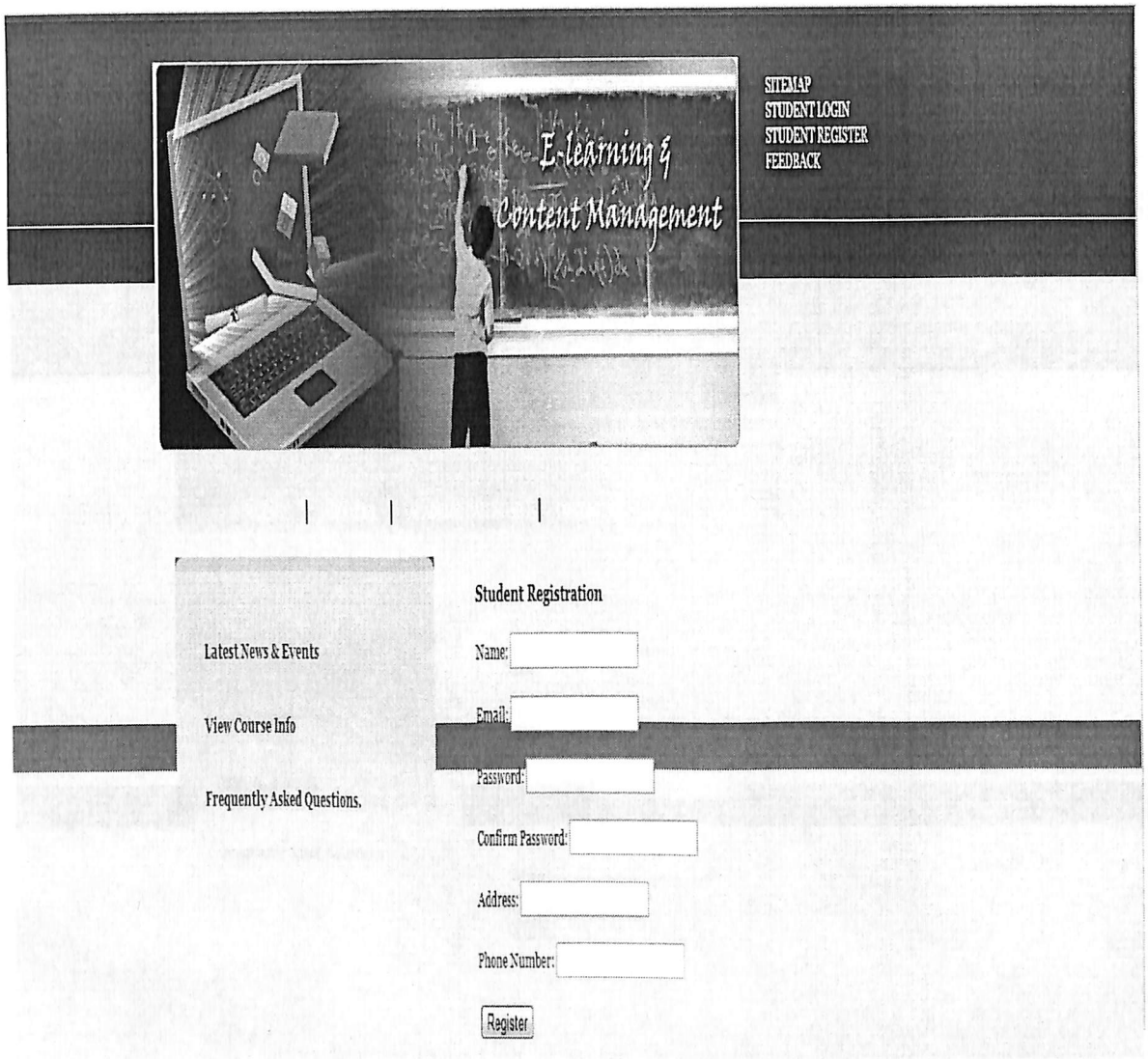
HOME PAGE



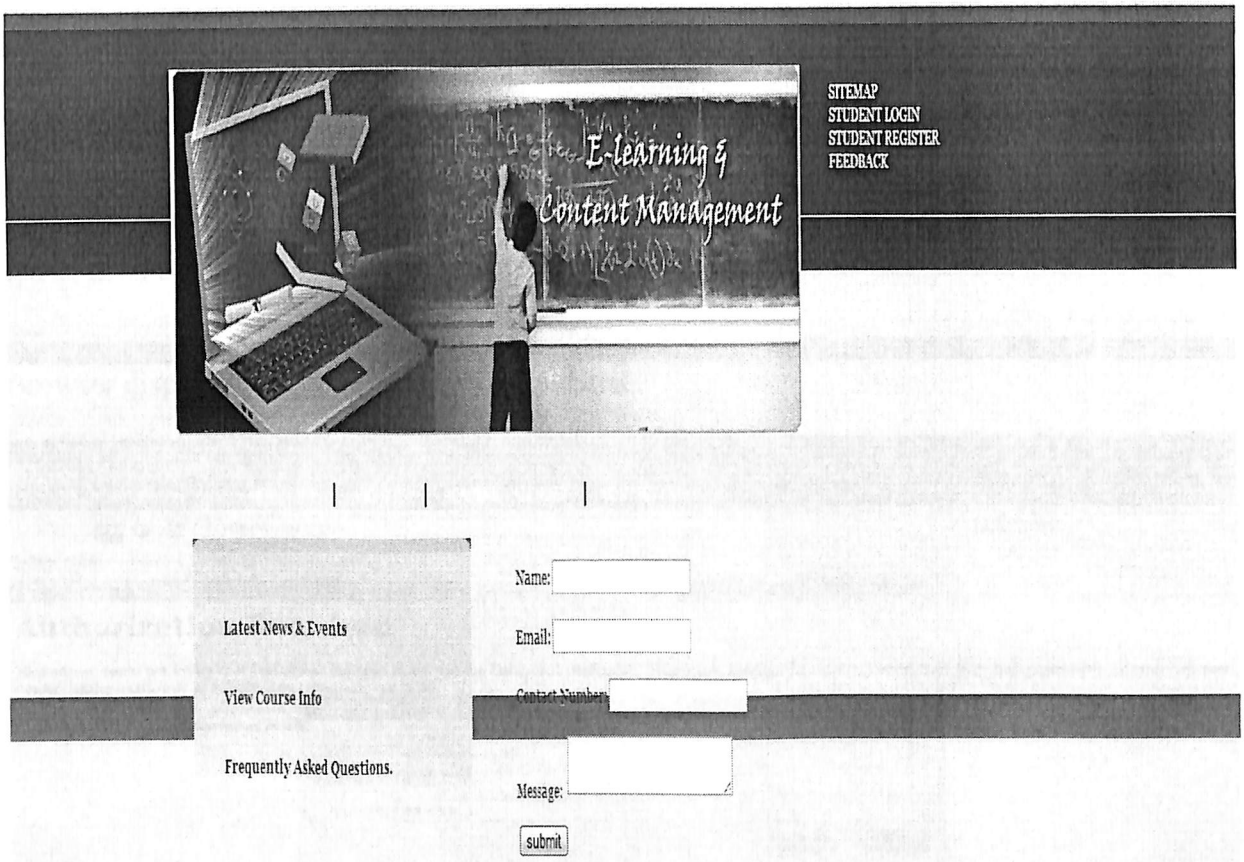
STUDENT LOGIN

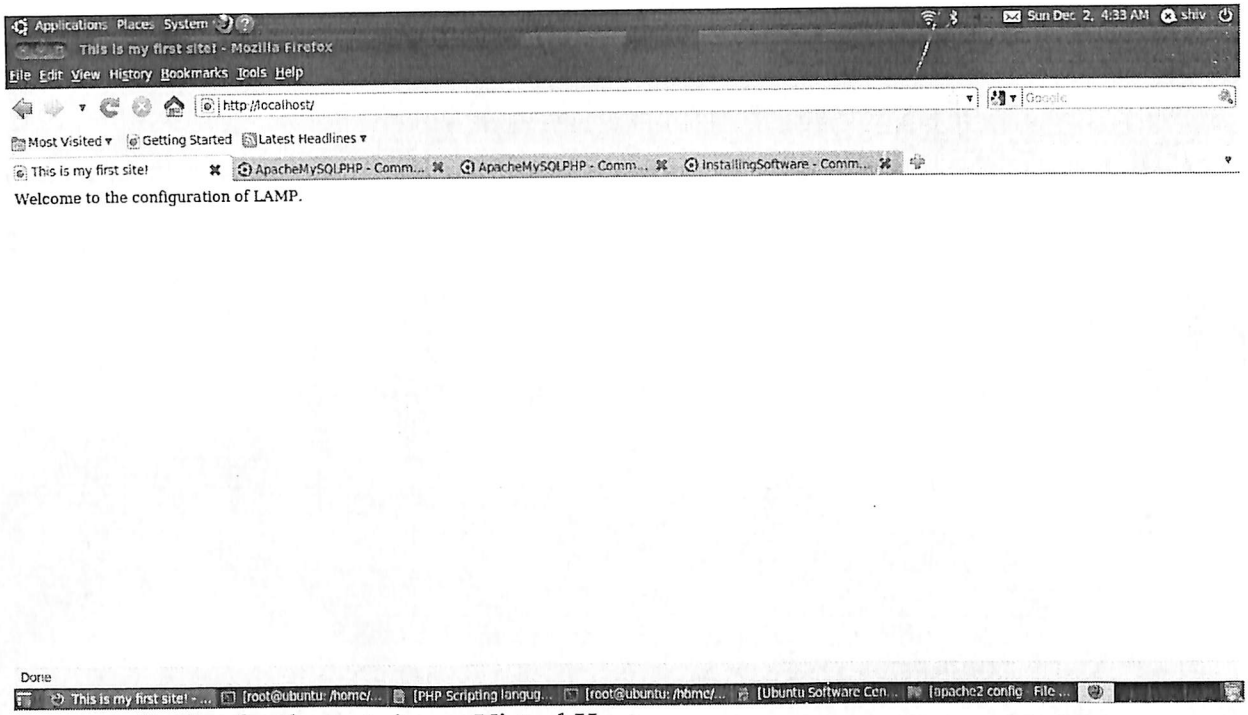


STUDENT REGISTER

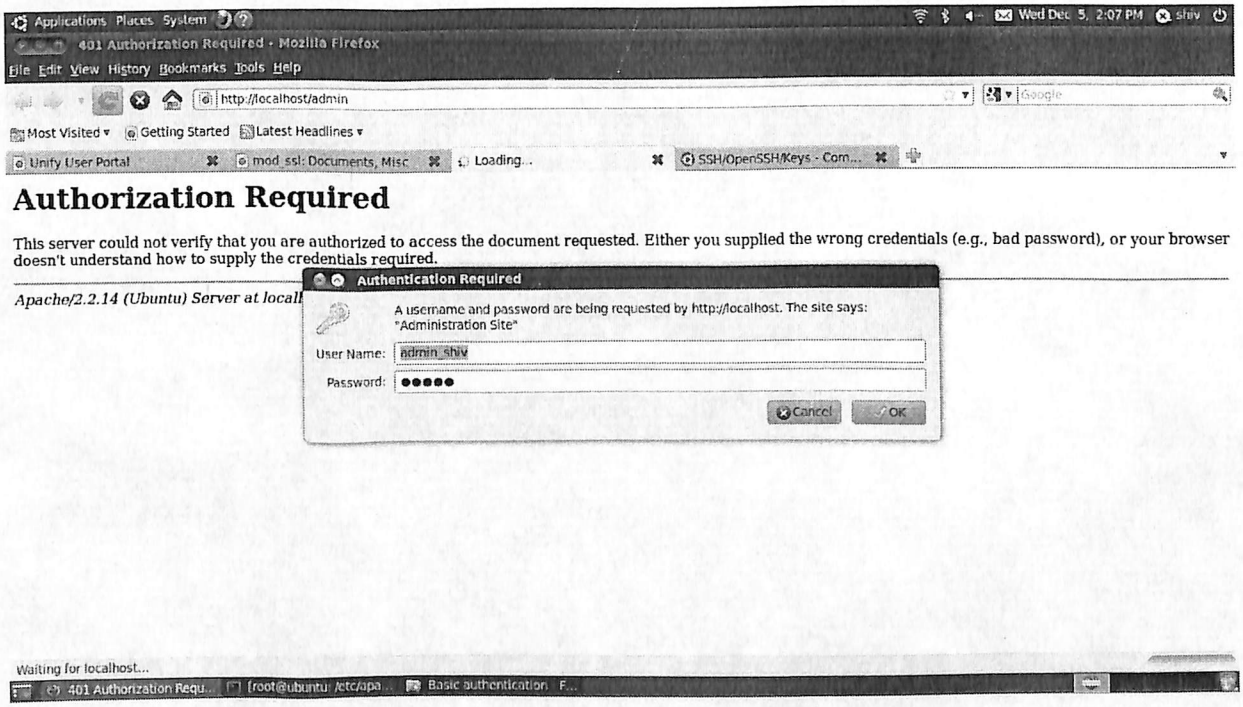


FEEDBACK

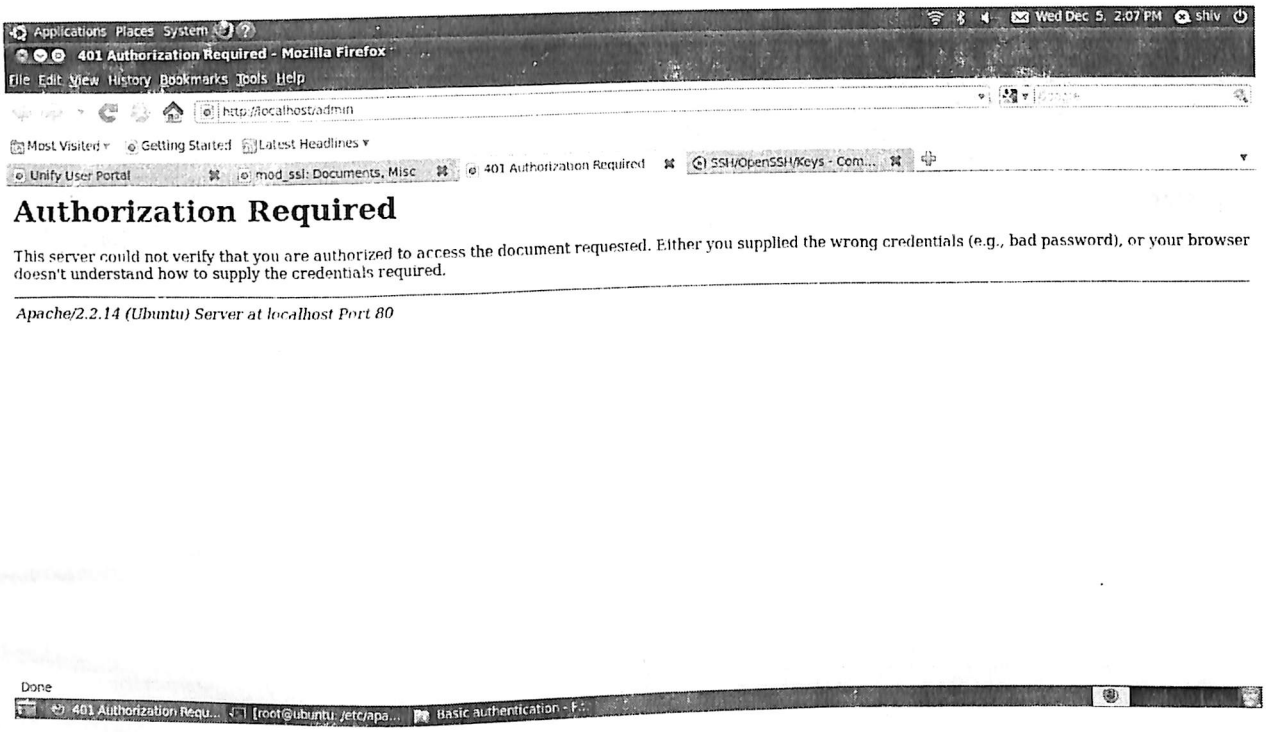

E-learning &
Content Management
SITEMAP
STUDENT LOGIN
STUDENT REGISTER
FEEDBACK
Latest News & Events
View Course Info
Frequently Asked Questions.
Name:
Email:
Contact Number:
Message:
submit



Browser display for the test site on Virtual Host



Browser prompting for the admin credentials



Access denying error message being displayed